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I

THE PROPOSED UNIVERSITY FOR LONDON

One of the principal educational topics discussed in England during the past year has been the reorganization of academic work in the metropolis. It has long been felt that the largest city in the world ought to have in it a great seat of learning; and that a London university, analogous in its scope and aims to the University of Berlin or of Edinburgh, or to the Academy of Paris, might reasonably be expected to find a place among the many institutions of the capital. In fact, the material for a university already exists. There are two great colleges—University and King's, and many smaller seminaries for general academic education of the most advanced type. There are the law schools of the Inns of Court, the great medical schools attached to hospitals, the College of Surgeons and of Physicians, the South Kensington Schools of Art and Science, and the City and Guilds of London Institute for practical science. But these institutions are isolated and unrelated. They are in no organic connection with a great university system, nor with each other. To many of the most earnest and enlightened friends of educational progress, this state of things appears to be anomalous and unsatisfactory; and among them there has been much discussion as to the best means of supplying a remedy for it.

There is, however, a well-known institution entitled the University of London, which, although it does not fulfill the purpose of co-ordinating and bringing into harmony the scattered intellectual resources of the metropolis, nevertheless

discharges educational functions of high value and importance. It is in fact an imperial or cosmopolitan rather than an exclusively metropolitan university. As its history is a curious one, and as it has in the course of years assumed a character wholly unlike that of any university in Europe or in the United States, some details respecting its origin and development may not prove wholly unwelcome to American readers.

The desire to make the metropolis a great center of academic teaching has found expression in several ways ever since the time of Elizabeth. In that reign (1578) Sir Thomas Gresham established seven lectureships of divinity, astronomy, music, geometry, law, rhetoric, and physic, and provided a house in the city, and an endowment for the stipends of the professors. Stow, the annalist and antiquarian (1615), speaks of the three universities of Oxford, Cambridge, and London, and enumerates as the constituent parts of the third of these —the Gresham foundation, the divinity schools attached to Westminster Abbey and St. Paul's Cathedral, the Inns of Court and of Chancery, the College of Heralds, the School of Civil Law, and St. Paul's School, then newly founded by Dean Colet—as parts of a complete collegiate system "wanting nothing but a common government and the protection of an honorable Chancellor" to give to it the unity and repute of a great London university. Bacon in his *New Atlantis* sketched out the plan of a confederation of philosophers, who should devote themselves to the systematic investigation of the facts of nature, to the due trial, recordation, and classification of physical experiments, and to the business of research and learning generally. This however was only a vision, and no attempt was made to realize it in practice. But Cowley, the poet, whose imagination had been strongly impressed by Bacon's glowing description of Solomon's House, with its laboratories, its organized body of observers, and its hierarchy of teachers, inventors, and interpreters, sought in 1661 to give definiteness to the whole project, by putting forth a proposition for the advancement of experimental philosophy by means of a great college near the Thames, with a body of twenty

resident professors, and with ample provision for teaching in science and in the liberal arts. The time of the Restoration was not, however, propitious. The great calamities which befell London in 1665 and 1666 turned the thoughts of her citizens in other directions, and Cowley's proposition dropped out of sight. It was not till the end of the first quarter of the present century that the desire for a metropolitan university assumed a practical shape. A great proprietary body was formed, mainly at the suggestion of the leading Whig statesmen, such as Brougham, Lansdowne, and Russell, and of literary men, including Campbell, the poet, and with their help the building now known as University College was erected, and designated, somewhat prematurely, the London University. Before, however, it could become entitled to that name, it was necessary that it should obtain a Royal Charter empowering it to confer degrees, and in the state of academic and political opinion then prevailing, the granting of such a charter was not an easy process, and was the subject of prolonged public discussion. The Universities of Oxford and Cambridge—at both of which religious tests were in force, practically excluding all but members of the Church of England—protested against the proposed university partly on the ground that it was injurious to the interests of the older corporations and unnecessary in itself, but mainly because it was designed to grant distinctions for learning alone, without reference to theological opinions, and thus to part with one of the securities which were by many regarded as essential to the maintenance of religion in the land. A new factor in the problem appeared when in 1829 King's College, London, was established by a powerful body of Conservatives and ecclesiastics, as an institution in which "instruction in the doctrines and duties of Christianity as taught by the Church of England should be forever combined with other branches of a useful education." The college was erected avowedly in rivalry with the so-called London University, and was designed to supply the religious teaching which that wholly unsectarian institution was precluded by its constitution from offering to its students.

The government, in 1835, solved the difficulty by granting separate charters to both colleges, recognizing each as one for academic instruction only, and at the same time calling into existence a new and independent body composed of eminent persons in literature or science who should be incorporated under the title of the "University of London," and who should be empowered to examine the students from the two great London colleges and from others which might afterward be added, and to confer degrees and honors on such students. Thus the functions of teaching and examining were intrusted to separate bodies; and as other colleges of repute in different parts of the country were from time to time admitted to the same privileges, the University of London became in fact, not exclusively a metropolitan institution, but a federal university, including in its scope many colleges in London and the provinces, leaving to them perfect liberty of teaching, but requiring all their students who wished to obtain academical degrees to present themselves at a common examination conducted, not by their own teachers, but by the Senate of the University.

This state of things remained unaltered for about twenty years. But experience showed that the tie which bound the affiliated colleges to each other and to the University was weak and ineffective, that the certificates of collegiate attendance, which were required by the University as a condition of admission to the examination for degrees, were given in very different ways, and possessed very different values in the various colleges, and that the University itself had no power to insist on uniformity of practice in this respect. The only functions which the Senate performed were those of framing regulations and of examining for degrees. It was admitted on all hands that this duty was well discharged, and that the University resolutely maintained a high—if not a severe—standard in its examinations. While, however, on the one hand, experience showed that the requirement of attendance at an affiliated college afforded no real guarantee of academic discipline, it became evident, on the other hand, that a large

number of students whose knowledge had been acquired in other ways, from erudite parents or private tutors, or in smaller colleges, would greatly value the opportunity of submitting themselves to examination and obtaining recognition from the University in the form of a degree. Accordingly, in 1858, a new charter was obtained empowering the Senate to admit as candidates for graduation any other students than those from affiliated colleges, provided that they furnished the needful evidence of character. The Senate at the same time instituted intermediate examinations between that for matriculation and that for the degree of Bachelor; and in this way sought to take new securities for continuity of study, by way of substitute for the former requirement of collegiate attendance. From that time the Senate has been an independent examining board mainly, having no organic connection with the colleges, and influencing the business of teaching only indirectly, through its programmes and syllabuses of study and through its periodical examinations for degrees. But its influence has very largely increased, and it has done much to raise the whole standard of the higher education not only in colleges, but among privately taught students throughout the country and in the Colonies. In 1858 the number of candidates for matriculation was 299, and for the degree of B. A. only 72. But in the single year 1891 the number of candidates for matriculation had risen to 2889, for the intermediate examination in Arts to 619, and for the degree of B. A. itself to 401. The numbers in the several faculties of Law, Science, and Medicine have shown a corresponding increase; the body of examiners appointed by the Senate has included from time to time many of the most eminent scholars and scientific experts in the country; and the rigid impartiality and high rank of its examinations have secured for the University a large measure of public confidence. In particular its medical degrees are generally regarded as among the highest distinctions obtainable in the profession, and have done much to raise the standard of scientific education, and to encourage original effort and research. The University of London was

the first British university to establish degrees in science, and it also has been distinguished from the older universities by the early encouragement it gave to the study of English philology and literature. An important step was taken in 1878 when the Senate obtained from the Crown permission to admit women to the examinations in all the faculties exactly on the same conditions as those which applied to men. No particular credit can reasonably be claimed for the University on the ground that it was the first academic body in the United Kingdom to take this important step. The older universities were necessarily more hampered by ancient charters and traditions, and were obliged to move more slowly. But Cambridge, Oxford, and the Scotch universities have since made substantial advances in the same direction; and in Cambridge especially, with which the two famous colleges for women, Girton and Newnham, are for all practical purposes incorporated, the whole advantage of university life and residence and the stimulus of the university examinations are now as accessible to women as to men. The opening, however, of all the London examinations to women, has exercised large influence, both direct and indirect, on all the principal institutions for the higher education of women throughout the country, and has probably given a healthy stimulus and much useful guidance to many other students than those who have actually presented themselves at the University examinations. During the thirteen years which have elapsed since those examinations were thrown open, 2225 women have passed the matriculation examination, 586 the intermediate and 334 the final examination for the degree of B. A.; 22 have obtained the degree of M. A., 58 that of Bachelor of Science, 25 that of Bachelor of Medicine, and 3 have advanced to the degree of Doctor.

In these and in many other ways the London University has come to possess a character and to discharge duties not contemplated by its original founders, and indeed not closely resembling those of any university in the world. It has become a great instrument for stimulating, guiding, and

rewarding erudition and scientific and literary proficiency however and wherever acquired, whether in privileged schools and colleges or not. There is such a general consensus of opinion in regard to the value of this work and to the skill and fidelity with which it has been done, that no one seriously advocates any interference with it. But it is still true that London does not possess a real local university in the sense in which the term is generally understood; and there has of late been a strong movement of public opinion in favor of establishing such an institution. Eight years ago an influential association was formed with a view to improve academic organization in the metropolis. Its members urged that it was the business of an university to *teach* rather than to examine, and that except indirectly the London University did little or nothing to control teaching, or to bring into harmonious relations the most important agencies concerned in the higher instruction of the metropolis. In particular the professors in the great colleges contended that they had no voice in the councils of the University, that schemes and programmes of study were issued by an external authority and enforced upon all candidates for graduation, and that in this way the legitimate influence of the teacher in shaping the course of instruction and in setting before his students his own highest ideal was injuriously restricted. Finally, there existed among a large body of the foremost scholars and *savants* a strong desire for greater economy of teaching power in London, for more effective encouragement of the higher learning, and for the establishment of a more friendly and helpful *rapport* between the various institutions, now practically isolated, which control academic and professional instruction in the metropolis.

The first practical proposal to meet the want of a "Teaching University" originated with the two principal London colleges —King's and University—which, forgetting or laying aside their ancient rivalries, propounded a scheme for the establishment of a new university, to bear the name of the late Prince Albert, and to consist in the first place of those two colleges

and the principal medical schools, although with power to attach in federal union other academical bodies from time to time. This new institution was to differ from the present London University, (1) in being locally confined to the metropolis, (2) in making regular attendance at collegiate lectures a condition precedent to the admission of students as candidates for degrees, and (3) in giving a substantial share in the government and in the general control of all degree examinations to the professorial or teaching body. In accordance with many precedents, the government of the day, when confronted with a problem of a highly intricate and technical character, had recourse to the advice of a Royal Commission, composed *ad hoc* of seven distinguished members of other universities, who after examining much evidence reported generally that the need for a teaching university in London was clearly made out, but that there was no manifest necessity for a second university. They suggested a plan whereby the existing body might continue to discharge its present imperial or non-collegiate functions, and yet meet the reasonable requirements of the London teachers by recognizing in their case systematic collegiate training as part of the requirements for an academic degree, and by according to the teachers a definite position and authority in the general management of the University. They concluded by advising the Crown that if the authorities of the University would consent to some such compromise, no new institution would be needed; but that if that course were not taken the establishment of a second or "teaching university" in London would be justified.

Some grave difficulties emerged into light when the Senate and Convocation of the University addressed themselves to the task of framing such a compromise as the Royal Commission had suggested. It was found that the various corporate and collegiate bodies which it was proposed to include in the University, though not unwilling to nominate representative members on its governing council, evinced no desire to part with their autonomy, or to submit to the control

of any central body. Among the teachers and lecturers of the London medical schools there was a strong wish for such a change in the requirements of the University as would make the degree of M. D. easier of attainment; while among the existing graduates of the University there was a strong objection to any measure which would lower the standard of qualification. On the part of the numerous provincial colleges, which were accustomed to send up candidates for graduation, and on the part of private teachers generally, great objection was urged against this proposal to transfer the business of examination from the present perfectly independent and impartial Senate to the representatives of London colleges, whose interests it was contended were mainly identified with those of local institutions rather than with the general interests of learning. In effect, it was found difficult to formulate a scheme which would secure the unanimous approval of the Senate, of Convocation, of the London colleges, and of the provincial institutions. In these circumstances, the scheme of the two London colleges for securing a separate charter was revived, and under the amended title of the Gresham University, the Privy Council approved this scheme, and the government of Lord Salisbury expressed their readiness to support it in Parliament. The fuller discussion of the Draft Charter early in the year 1892 was, however, very unfavorable to its provisions. In the press, in Parliament, and in academic circles generally it was argued that the scheme was narrow and inadequate; that it was too diversely framed rather in the interests of two or three privileged institutions, than in view of the larger educational requirements of the metropolis; that it gave, in effect, too much power to the professors of those institutions to assess their own work; and, above all, that it called into existence a second university where one would suffice. These and other objections proved fatal to the Gresham scheme. It was withdrawn by the government, and a second Commission was formed, composed of representatives of the principal academic and professional interests concerned, to make further

inquiries, and to report and make recommendations accordingly.

Until this second Commission shall have made its report it is impossible to say how this difficult problem will eventually be solved. The whole process, though it must seem dilatory to foreign observers, is somewhat characteristic of English habits and procedure in such matters. The foundation of a university is in this country a business of rather serious magnitude. It cannot be effected by a stroke of royal prerogative, nor by the munificence of a single citizen, nor by the action of a local authority. The multiplication of competing universities, each with the power of granting academic titles to its own students, has always been regarded by Englishmen as a danger to be avoided. The existence in the United States of nearly 500 chartered institutions vested with such a privilege may probably be of service in promoting educational activity, and in stimulating the appetite for higher knowledge. But it would be unsuited to the soil and traditions of this country; and in the opinion of scholars would tend to injure the true interests of the higher learning, and to lower the value of an academic degree. The general result of all the elaborate discussion which the whole subject of a Teaching University for London has received, appears to be that it is rather by the strengthening, enlargement, and reconstruction of the existing university than by the foundation of a rival university in the same city, that the true solution of the difficulty is to be found. It ought not to be impossible to maintain in full efficiency the larger and imperial work now so well discharged by that institution, and at the same time to associate with it the best and highest teaching agencies of the metropolis, to give to the ablest of the college professors a substantial though not a dominant influence over the degree examinations, to promote in many ways the interests of science and scholarship, and to do for London what the Sorbonne and the Collége de France do for Paris.

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LONDON, ENGLAND

II

EDUCATIONAL EXHIBITS AT WORLD'S FAIRS SINCE 1851, (II)

It would be very interesting to trace the development of the educational classification between 1862 and 1893, and then show how far its provisions have been carried out at each of the exhibitions held during that period. Although a single article cannot present the details of such an investigation, it may show how some of the important features of educational systems have been represented at different times. Official classifications are too complex to be useful as a basis for this study, so it is necessary to find a simple scheme of grouping exhibits that will give uniformity to the treatment of all the exhibitions. The outline used by Mr. Philbrick in 1878 will answer this purpose. It is as follows:

First, illustrations of educational buildings with their furniture and fittings.

Second, illustrations, and specimens of appliances and apparatus, excepting books for instruction and training.

Third, pupils' work—literary, scientific, mechanical, and artistic.

Fourth, educational literature, embracing all printed matter bearing on education, but especially text-books and books of pedagogy.

In a consideration of the first division the question at once arises: Of what use is an exhibit of schoolhouses? In the reports for 1873, Dr. Seguin discusses some aspects of this question and shows that it is only when models are presented to the mind with proper explanations that they are really of value. It is in doing this that the intelligent critic finds his opportunity for usefulness. He may be sent to the exhibition to explain the objects to spectators or to write a report on what it contains. In either case it is his business to inter-

pret the exhibits in a way that will point out both the features that are typical and those that are not. It is inevitable that, where a schoolroom is removed from its surroundings, it should lose some of its significance. Was it a part of a large schoolhouse or did it stand alone? Was it in a crowded city or in the open country? Were the pupils from luxurious homes, filled with books and pictures, or did they find in this schoolroom all the intellectual stimulus they ever received? These are questions sure to occur to the mind of a thoughtful person who tries to get from the exhibition a picture of the school life it represents. In answering them he is aided by photographs of interiors and exteriors, of class rooms, and of laboratories containing pupils at work. By the use of photographs it is possible to represent educational systems and methods with great completeness. Photography has gained such perfection that every little detail of a scene can be faithfully reproduced. In the exhibit sent by the Westfield High School to Paris, in 1878, the methods used in teaching zoölogy, botany, and chemistry were shown in this way. One photograph represented a class studying the peculiarities of owls. A row of stuffed birds of different species was ranged along the teacher's desk. On the blackboard was a brief summary of the facts to be emphasized. Pointer in hand, the teacher was explaining the lesson, and two pupils near her were examining the birds to find the characteristics of which the teacher was speaking at the moment. The general appearance of the room, its furniture and apparatus for instruction, the alert teacher, the intelligent pupils, all were shown with wonderful distinctness.

In the plans for arranging exhibits in 1851, 1854, and 1855, there was no separate place for buildings or furniture devoted especially to education, but in the revised classification used for the Exposition of 1862 we find them assigned to a distinct class. The original plan had included a thorough exhibit of recent improvement in the plans of school buildings and in their furniture and fittings, but when the time came there was very little to be found in this department. Several models of

schoolhouses were shown, but these, although complete in their way, were not typical of the average schoolhouse used in any one country; and so they were of little use for purposes of study and comparison.

There was a single model that deserved special mention, as it was one of the earliest evidences of what has now become a most important element in international exhibitions, viz., the attempt to interest the public in philanthropic work by exhibiting results already attained. This model represented one of the schoolhouses on the Philanthropic Society's Farm at Red Hill, near London, and was carefully executed.

There were many miscellaneous articles of school furniture from England, but other countries sent very little. France had no manufacturer who devoted himself entirely to the production of school furniture. Her local artisans built from designs which were good or bad according to the intelligence and training of the particular individual who made them.

In 1867 we again find that educational buildings are given distinct recognition in the official classification. There were shown only four rooms designed specially for educational purposes. These were sent by Sweden, Prussia, Saxony, and the United States. The contribution from Sweden was a primary schoolroom on the first floor of a house also used as the teacher's residence, a type of building quite common in that country. In the school building sent by Prussia the home of the teacher also occupied a considerable part. The Saxon schoolhouse was for instruction of a higher grade, was classic in design, and had no residence attached. The United States building was a cross-road schoolhouse, sent by the State of Illinois. There are in the reports several discussions of the comparative merits of these school buildings, the methods of lighting and ventilating them, and of seating the pupils, but the representation as a whole was so slight that a discussion based on that alone would have very little value.

The schoolhouse from Saxony was unfurnished, but in the other three buildings there was a great variety of school furniture. The Prussian was bare and uncomfortable, the pupils'

benches being very long and lacking distinct boundaries to mark individual property. The teacher's desk, too, was without conveniences. On the other hand, the furniture from Sweden and from the United States allowed the pupils great freedom of action, as it gave each a separate seat and added many conveniences and even luxuries which were unknown to the Prussian.

Of the three exhibits of schoolroom furniture, the American was far the best, both for convenience, comfort, and neatness, and attracted the most attention.

The normal gymnastic school at Dresden made a very complete exhibit, including models of all the apparatus used, as well as of the buildings and grounds. It may be stated in this connection that there is scarcely a common school in Saxony and some other German states which has not a gymnasium attached.

In 1873 this department was represented with far greater completeness. Models, as well as schoolrooms of the size actually in use, were presented by a large number of countries, by cities, by school boards, and even by separate institutions. The United States built a representative school building such as may be seen in many rural districts of America. It attracted great numbers of people, and by actual count was visited by six thousand in a single day. It was completely furnished with school desks, teacher's table, harmonium, text-books, reference books, and all the accessories customary in the average American schoolhouse. The special features were the sash windows, allowing of more perfect ventilation with less danger to the pupils than is possible with the hinged windows opening inward, which are used in European schoolhouses; and curtains, which, as they could be pulled from the bottom up as well as from the top down, regulated the light with great perfection. It occasioned considerable criticism that the room was lighted on three sides, but on the whole this was recognized as a desirable feature.

In addition to the photographic views of various public

institutions of America, including many of the magnificent asylums for the deaf and dumb, the blind, the idiotic, and the insane, there were architectural designs of public school buildings in St. Louis, in Washington, and in various Massachusetts towns.

Although very unsatisfactory because of the absence of many features that are typical of her schools, the United States exhibit was really the most important one. "In the center of the entire educational court there was a model of the Franklin School building in Washington, which was by far the finest thing of its kind in the whole exhibition." The Washington city architect had constructed this model at great expense, in such a way that it could be taken apart and minutely examined. The systems for lighting, ventilating, and heating, for providing for safety in case of fire, and also the arrangements for seating pupils, and providing for their convenience were all open to exmination.

In 1876 there were articles illustrating school architecture, including, among many others, models of the primitive log schoolhouse, the *adobe* of California, a rural district schoolhouse, and the Franklin School building in Washington. There were also articles illustrating school furniture and apparatus.

In the Belgian exhibit, the most notable part was a room for a primary school. It was sent by the Belgian government, and represented the type which government regulations require whenever new public school buildings are constructed. In the report of the United States Commissioners, there is a description of this building, and also a translation of the regulations in regard to it. The location, exposure, and extent of grounds and buildings, the mode of construction, interior arrangement, separation of the sexes, division of classes and dimensions of rooms, the arrangements for lighting, ventilating, and warming, and the rules about playgrounds, cloakrooms, lavatories, and airing places, are all prescribed with great minuteness.

Much to the surprise of everybody, France was not repre-

sented by anything which would come under this head, nor was Germany.

The exhibits from Great Britain and her colonies were extremely disappointing, those from Canada being the only ones at all satisfactory. The Netherlands, Norway, Sweden, Switzerland, Portugal, and Japan were partially represented.

In 1878 the showing of school buildings was very comprehensive, and supplied to the official reporters, and to all who examined them, the stimulus for many suggestive comments on school architecture and the problems connected with it. Belgium sent some very interesting exhibits in this class. Many of her schools were represented by plans and models of buildings, and by specimens of school furniture. One (which was established in Brussels by the Ligue de l'Enseignement in 1875) sent furniture and school materials and the accessories of every sort necessary to show a classroom complete in the minutest details. It was visited by great numbers of people who found that although its fittings were less comfortable and convenient than those of the United States, they were far above the average of those in use on the Continent.

Portugal showed photographs of some of her finest schools, and also sent a model of a school building that "seemed much like our familiar country schoolhouse."

Algeria sent very attractive models of school buildings and made a creditable display of pupils' desks and seats.

In the remarkable exhibit of Japanese education there were photographs, plans, and sketches of the buildings for imperial and public schools, and the grounds that surround them. "There was also a collection of models in wood, reproducing in the most skillful and beautiful manner many buildings, new and old, used for school purposes. Some of these were said to be ancient temples capable of accommodating a thousand persons, and were certainly picturesque and charming to the eye, however they may be found to serve for the convenience of schools." Pieces of school furniture of curious Oriental shapes also formed a part of this collection.

The exhibit of the United States in 1878 is described by Mr. Philbrick as follows:

"Educational architecture was represented, in the first place, by two well-made models—that of the State Normal School of Indiana, a fine edifice, and probably one of the best in the country, and that of the Henry Grammar School, in the City of Washington, which has some original features, but which represents very well the essential characteristics of the best grammar schoolhouses found in American cities.

"The wall display of educational edifices was composed of marked specimens without any repetition of similar types. Beginning with plans, and a view of the first Normal School building erected in the United States, that of the Bridgewater School, in Massachusetts, together with a view of the building as it now stands, with its successive enlargements and improvements typifying the growth of the normal school system in our country.

"The information respecting school architecture found in reports and books on the shelves of the exhibition was probably much more useful to educational investigators than the illustrations above mentioned. The custom which is so general in the United States of including in State and city school reports illustrations and descriptions, has done much to diffuse information on the subject, both at home and abroad. Our space would allow but a very limited display of school furniture."

At New Orleans in 1885 this section contained numerous plans, photographs, and models, illustrating American and English schools. Physical education was represented by a fully equipped Swedish gymnasium, sent from England, and also by an exhibit made by the United States Bureau of Education, containing three kinds of apparatus:

(1) Home gymasiums;

(2) Special kinds of apparatus;

(3) Instruments for taking anthropometric measurements.

In 1889 there were many interesting exhibits in this section. Belgium, Switzerland, Brazil, Argentine Republic,

Japan, and England showed school architecture in the Department of Social Economy. Cost of construction and of maintenance, use of local materials, adaptation to climatic conditions, and the requirements laid down by sanitary science were all brought forward prominently. The Emperor Dom Pedro was awarded a Grand Prix in recognition of his efforts to introduce the best sanitary arrangements into the schools of Brazil. In the exhibits of school furniture, due almost entirely to private initiation, England took the lead.

Among the lesser exhibitions, two that have been held in London should be mentioned in this connection. The earlier, in 1871, contained the first attempt to show the progress of education in India. There was a model of the Aided School of Baikala, an "ordinary mat bungalow of Northern India" that seemed "to be no better adapted for a school than for a police station or a private residence." There were three wooden models of the Buddhist monasteries, where native boys receive a primary education, and also photographs of "the grander monasteries—built of teak timber, magnificently carved and gilded," and of many buildings intended for other purposes, but now used as schools. For furniture there was a "mat intended to illustrate the cheap and portable seat used by pupils in indigenous schools, price one penny, made of Palmyra palm leaves by the boys themselves." There were also clay models that showed in sharp contrast a government school with English forms and desks in charge of an active teacher, and two indigenous schools, one Mohammedan and the other Hindoo, "with the masters in a recumbent position, smoking."

The Health Exhibition, London, 1884, contained the latest and best devices for the building, fitting, and sanitary arrangement of schools, and for school decoration. A great many things relating to healthy conditions and surroundings in home and school were brought together at that time. There were also lectures and conferences on subjects suggested by these exhibits, and handbooks containing reliable information.

Physical education was fully represented, and a large amount of data collected to establish a "science of national health."

The second division (including materials and appliances for instruction, except books) has always been represented at international exhibitions, although not at first under the head of education. Manufacturers who wished to introduce certain specialties, such as physical apparatus, maps, charts, etc., gave them a place among other products of a similar nature. Their purpose was to sell their goods, or to demonstrate the superior value of their methods of manufacture. In 1851 geographical charts, maps, and models for design were considered simply as specimens of engraving; books were examples of the skill attained by typographers and binders and were judged for beauty of execution and for cheapness; and the toys exhibited by Germans and, to a less extent, by the French, were also classed under manufactures. Besides these things, there were shown materials, apparatus, and processes for scientific and philosophical research, and for use in the practice of engineering and the fine arts, and a great many other things whose educational significance had not yet been recognized in the arrangement of World's Fairs.

In 1873 the classes for education contained, for the first time, a comprehensive exhibit of materials and appliances. Objects shown by five thousand exhibitors, representing twenty different nations, were submitted to the jury on education. In addition to the representation of the industrial, manual training, and art schools already mentioned, and institutions for educating the defective and dependent classes, there were many examples of materials and apparatus used in the nursery, the *crèche*, and the kindergarten, and in primary, secondary, superior, and professional schools.

The United States Commissioners' report for 1873 says: "The educational exhibitions in the aggregate embraced every conceivable object used in giving instruction in every class of schools," but "there were instances of total failure on the part of some of the great nations, and if Austria could be excepted, even the best of the representations were but frag-

ments of what they might have been made with earnest and systematic effort on the part of the several governments."

This statement might be repeated almost exactly in discussing all of the subsequent exhibitions. Each time there have been added many new features, representing the improvements made in education during the interval, and also such parts of the systems of particular countries as were not represented before; but as a picture of educational conditions throughout the world no exhibition has been very satisfactory.

The third division (pupils' work, literary, scientific, mechanical, and artistic) has been discussed at considerable length already, as far as the mechanical and artistic parts are concerned. In the scientific part there have been students' collections of specimens and photographs, illustrating the botany, zoölogy, geology, and physical geography of different portions of the earth. There have also been volumes of written or printed essays prepared by students, describing their researches in physics, chemistry, biology, and other sciences, and also volumes containing work of an historical, economic, or literary character. In many cases these represented popular education. In 1876, for example, there were thousands of examination papers, compositions, and essays written by pupils in the primary, grammar, high, and normal schools of the United States.

M. F. Buisson, in a supplement to his celebrated report on the primary school system of America, presented several hundred examples of the pupils' work sent to the Centennial from a large number of rural and city schools. He describes this collection in a preface, from which the following is translated:

"This volume is not a book on the schools of the United States; it is a book written by the pupils themselves. He who will take the trouble to go over these pages, gathered from all parts of the Union, may, with good right, imagine that he makes a rapid voyage of inspection through these schools of the United States. He sees them here in certain respects more exactly than might be permitted to him in visit-

ing them. He is present at the ordinary class exercises; he there surprises the secret of the methods in their daily application; he freely examines the productions of the pupils, he hears their confidences on the comings and goings of student life, and perhaps he learns from their mouths more than one detail that he did not know about the true state of the school, of the family, and even of American society."

At the Exposition of 1889 France showed pupils' work that represented a comparatively new feature of her system, viz., the preparation of monthly tasks in which the pupil tries to surpass not his classmates, but himself. These tasks, which are always filed for reference, afford a frequent test of the progress made by the student in his work, and also do away with the pernicious rivalries that are sure to arise in a class of students having very unequal abilities.

It is hard to make sure that the pupils' work shown has been prepared under normal conditions, and fairly represents the school from which it comes. For example, the work of Swiss pupils and teachers at the Exposition of 1889 was described in the jury reports as "too faultless to be genuine." The kindergarten teachers feel so strongly in this matter that they are extremely careful not to let the children get the exhibition idea. They ask them rather to prepare a monument to Froebel, or to some other worthy, and as this is an idea familiar to the child and in harmony with the kindergarten system, it secures an exhibit under perfectly normal conditions.

The fourth division (educational literature, embracing all printed matter bearing directly on education, but especially text-books and books of pedagogy) contains a great deal of material that is very important to the student of education. In 1862 there was in the main building a recess devoted to the exhibition of a collection of the most recent text-books and manuals employed in teaching. The entire educational exhibit from Russia that year consisted of a few books.

In 1867 there were text-books from the primer to the calculus and classics, schemes and reports of educational institu-

tions of every grade and character, and copies of annuals published by educational societies, institutions, and states; fine art works from American publishers; a valuable series of publications upon science, art, medicine, and morals sent by the Viceroy of Egypt as specimens of typography from the government establishment, Boulac, Cairo; and books sent by the government of Hawaii as specimens of native publications in English and in the Hawaiian language. The United States Commissioner says of the latter: "They were curiosities, simply showing the mechanical march of letters into regions where education had scarcely penetrated. They had no claim to typographical merit."

In 1873 there were "school reports and reports of educational departments of State and national governments; published works on education: historical, pedagogical, and philosophic; and specimens of newspapers and other publications as illustrating the quality, variety, and quantity of the information supplied to the people through the medium of the periodical press and the publications of learned societies of every class, devoted alike to the advancement of knowledge and its diffusion among men."

In 1876 this section was well represented, especially in the collections sent by the United States Bureau of Education and by the several States and cities that contributed.

In 1878, one of the most important collections of books shown was the series issued by General John Eaton as United States Commissioner of Education. For some time they had been known and admired by foreign educators, and the ones then published had received the highest awards in 1873. They were influential in bringing about the establishment of the Musée Pedagogique, which is similar to the Bureau of Education maintained by the Government of the United States.

Public libraries were well represented, and an exhibit of Webster's Dictionary in its various styles and editions attracted great attention. There was a complete collection of American publications on pedagogy, in which the set of twenty-six large volumes of the *American Journal of Educa-*

tion formed an important part. Some of the contributors sent a large number of duplicates of valuable reports and other educational documents for gratuitous distribution.

The country holding an exhibition is always well represented; other governments, cities, and institutions of a special or technical sort sometimes send carefully prepared exhibits; but as a complete picture of the state of education throughout the world, no exhibition has been a success. This is partly due to the fact that no nation will show itself to the best advantage on any but neutral ground. Four of the eight great expositions have been held in France, and so, for at least half the time, Germany has not even tried to do herself justice, and other nations have taken a similar position. Again, there has never been a World's Fair that was advertised properly. Distant nations have been ignorant of the greatness of the opportunity offered until it had passed. The Columbian Exposition does not have to meet either of these obstacles. The United States is at peace with the world. Early announcements of the proposed exposition have been sent to the remotest parts of the earth, and it is now almost certain that, if space is provided, there will be received from every civilized nation an exhibit of its system of education. Such a collection placed in a single building would be the capstone of the whole Exposition. It would symbolize the forces that have produced the civilization of to-day, and made possible this great gathering of the nations.

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III

PUBLIC SCHOOL PIONEERING

FINAL STATEMENT OF THE MASSACHUSETTS CLAIM

If any readers of the REVIEW have had the courage to follow this discussion, they will remember that in June I selected from what seemed to me the many historical inaccuracies contained in Mr. Draper's April article a few of the most glaring. These were, first, that which represented England as schoolless in the sixteenth century; second, that which represented Dutch New York as having a free public school system, the pioneer system in America; third, that which asserted that Massachusetts had no such system, indeed had no free public elementary schools during the first 150 years of its history.

Of two others to which he gives much prominence in both articles I have only a word to say. The action of the Plymouth colony is not involved in this discussion. Plymouth was not Massachusetts until 1692, and for all the purposes of historical inquiry is as distinct as is Connecticut or New York itself. The paper which was the basis of this discussion had Massachusetts for its theme and not Plymouth.

There is, however, one feature of this Plymouth matter which is amusing. Mr. Draper refers to the recently published work by Mr. Douglas Campbell as sustaining his own contention about the Dutch and English schools. This reference would have more weight did not Mr. Campbell in this same work refer to Mr. Draper as sustaining him. Now having given to each other this testimonial of good character, they proceed to contradict each other the first time they meet.

Mr. Campbell says of the Plymouth people: "When the Pilgrims from Holland landed at Plymouth one of their first acts was to establish a common school."[1] Mr. Draper says: "In the Plymouth colony there was no school of any charac-

[1] *The Puritan in Holland, England and America*, I: 30.

ter for fifty-two years after the settlement." Now the ignorant reader might believe either of these gentlemen. He could not possibly believe both.

> How happy could I be with either,
> Were t'other dear charmer away!

The intelligent reader can believe neither, for both are wrong. The Plymouth people did not set up a school immediately upon landing. Neither did they wait fifty years. There are entries in court records which show that a school existed in Plymouth as early as 1635, fifteen years after the landing; and the town records of Marshfield contain the account of the establishment of a school in that town by Governor Edward Winslow and others in 1645. These mutually supporting historians ought in some way to "get together." The matter of the education of girls in Boston, of which Mr. Draper makes much account, is also irrelevant. In the sixteenth and seventeenth centuries girls were rarely educated beyond the knowledge of reading and writing acquired in the same schools. Throughout New England the country schools were opened to girls, if they chose to attend, but few availed themselves of the opportunity—as an early historian of the ancient town of Essex says, "only those who thought a good deal of themselves." In the larger towns, where were masters' schools, girls were not expected to attend, because it was not the fashion. When girls wanted the opportunity they received it, though in some cases grudgingly at first, as girls have been admitted to the colleges for men. But all this has nothing to do with the question of pioneering. The greater part of Mr. Draper's second article is devoted to a single paragraph in my paper read at Philadelphia. That paragraph was a summary, and declared that in the development of the compulsory educational system of Massachusetts there had been six distinct steps, each of which Massachusetts took in advance of the other States.

Mr. Draper denies this statement in general and in particular. He affirms in substance that Massachusetts never had an

educational system, that it was never compulsory, that it was never developed, that the six steps exist only in the writer's imagination, and finally, that the only sure thing about Massachusetts is an arrogant and everlasting assumption of superiority, which he, for one, proposes to submit to no longer. The crushed worm turns at last, and Massachusetts is shown up in all the hideousness of her naked deformity.

It is my purpose in this paper to reconsider this summary in detail. I shall not attempt to do what Paley found to be impossible, to "refute a sneer," but shall give the facts.

The first compulsory enactment was in 1642, decreeing that all children should be brought up to "learning and labor," the learning to include a knowledge of the capital laws and of the principles of religion. That was a wonderfully comprehensive scheme for that age, indeed for any age. Besides the art of reading, the gateway to all knowledge, it included industrial education, civics, and religion. How to incorporate these three subjects into the educational system is a problem that all educators of the present day are struggling with. The execution of the law was provided for by a system of house to house inspection, so that even in the frontier settlements, too sparsely occupied to maintain schools, the children should not be suffered to grow up in "barbarism." That this law was operative is shown by the following extracts from the records of the town of Billerica:

1661. The townsmen do agree that Lieut. Will French and Ralph Hill, senior, do take care and examine the several families in our town whether their children and servants are taught in the precepts of religion, in reading, and learning the catechism.

1668. The selectmen appoint the next secondary to go the rounds to examine the teaching of children and youth *according to law*.

These are typical illustrations. If it can be shown that in New York or elsewhere a compulsory enactment equally comprehensive had been made by the people or their representatives as early as 1642, I shall be glad to acknowledge myself to have been mistaken. I am the more confident of my position because in the May number of the EDUCATIONAL

REVIEW[2] Mr. William B. Shaw, writing from the State Library at Albany, quotes this statute in full and attaches to it pre-eminent historical importance in the development of compulsory education in the United States.

The second step was the compulsory school law of 1647, which Mr. Shaw also quotes. Concerning this law Mr. Draper offers the puerile quibble that the law requires a *master* for elementary instruction and not a *school*. He fails to see the point. The word master is the glory of the law. It was the intent of the framers that the children who did not care for classical instruction should have more substantial advantages than were afforded by the dame schools of England and Holland. They meant a school taught by a man all the year round, for the benefit of all the children. So the people understood it; so the courts interpreted it. The records of the towns and of the courts furnish abundant evidence to those who want to know. As I have shown in the former article such schools were everywhere established, usually voluntarily, sometimes under the compulsion of the courts. Mr. Campbell, Mr. Draper's own authority, says: "By 1665 every town in Massachusetts had a common school."[3] It is for Mr. Draper to show that in New York or elsewhere as early as 1647 a similar compulsory school law had been enacted by the people.

The third step, as I have numbered them, was compulsory certification of teachers. Concerning this Mr. Draper declares that Massachusetts has never had any certification of teachers, compulsory or otherwise, that amounted to anything, because, as he says, the certificating and appointing power have been in the same hands. Here again Mr. Draper, like the persons in *Pinafore*, "means well, but he don't know." In 1701 by a province law it was ordered that every grammar school master must produce a certificate of qualification from the minister of his town and the ministers of two adjacent towns, or any two of them. This law meets even Mr. Draper's demands. It required a certification by experts, for the min-

[2] III: 445. [3] *Op. cit.* I: p. 30.

isters were the only persons competent to examine in Latin and Greek. It was independent of the appointing power, for the master was chosen by the town or by the selectmen acting for the town. To prevent favoritism the certificate must be signed by at least one out of town minister. Could there be a more complete recognition of the principle underlying the examination and certification of teachers?

This law was compulsory and operative. Witness the following extract from the town records of Sudbury, dated November 21, 1701, the same year in which the law was enacted:

> We the subscribers being desired by the town of Sudbury to write what we could testify in concerning the justification of Mr. Joseph Noyes of Sudbury for a *legal* grammar school master, having examined the said Mr. Joseph Noyes, we find that he hath been considerably versed in the Latin and Greek tongues, and do think that upon his diligent revisal and recollection of what he hath formerly learned he may be qualified to initiate and instruct the youth in the Latin tongue.
>
> JOSEPH ESTERBROOKS,
> JOHN SMITH.

This instrument will bear the closest inspection even in the light of the most modern methods.

But Mr. Draper had especially in mind the certification of teachers by school committees, who now have also the appointing power. When the office of school committee was made compulsory in 1826, and the power to examine and certificate teachers was conferred upon them, they did not have the appointing power. This was vested in the prudential committee of the districts, and the new office was created to remedy some of the evils of the district system. So that here again the certification was by experts, for the town school committees were composed of the best educated men in the communities, in spite of Mr. Draper's sneer about butchers, bakers, etc., and the appointing power was not in their hands. To establish a claim of New York to pioneering along this line some equally exacting law must be found bearing date earlier than 1701.

The fourth step was compulsory supervision. Mr. Draper affirms that Massachusetts has no supervision and never had

any, because, forsooth, "there is no supervision which is not professional supervision." He wisely refrains from defining professional supervision. Apparently, judging from his frequent references to the State and county superintendents of New York, he means supervision by men who give their whole time to it. This leaves out the most important element—fitness. New York has furnished so many examples of politicians masquerading as educators, while holding ephemeral positions as superintendents, that the New England States have been shy of the system.

In 1789 a law was passed in Massachusetts requiring the selectmen and ministers, as a special committee, to visit all the schools periodically, to inquire into their regulation and discipline, and the progress of the pupils in learning. That this was a recognition of the principle of expert, official supervision cannot be denied. That New York had taken any such step cannot be affirmed.

Well-kept records beginning with 1790 contain the reports of this official inspection. They contain the names of the committees who visited the schools, the number of pupils, their classification according to subjects studied, the discipline and spirit of the school, the proficiency or deficiency of the scholars in each study, and the committee's estimate of the teacher's ability and work. The opening pages of these records declare that the work is done in obedience to the law of the State, and the law itself is spread in full upon the records. Here is supervision and it is compulsory. It is supervision by experts, too; that is, by the men in the community best qualified to judge of the work of the schools. It was adapted to accomplish what official supervision is always intended to do, namely, to hold the schools up to the highest standard of the times. This may not have been "professional supervision," according to the New York standard, but it was practical supervision, which is all that I have claimed for it. As the New York school system had not been established when this law went into operation, it is evident that Massachusetts did the pioneering.

The fifth step was compulsory support by taxation. Mr. Draper says of this that he can find in the Massachusetts laws only a requirement that the towns shall raise "such sums as may be necessary," and he sneeringly asks, "How much compulsion is there in this?" More, perhaps, than appears on the surface. It may be observed, by the way, that a law which he did not find requires every town to raise at least three dollars for each child of school age as a condition of sharing in the annual distribution of the income of the State school fund. This may not be compulsory, but it looks in that direction.

What is included in the phrase "such sums as may be necessary"? Necessary for what? To meet the requirements of the school laws, namely, to maintain for at least six months in each year "a sufficient number of schools for all the children," "conveniently located," and "properly furnished"; if a town of 2500 inhabitants, to maintain, besides, a high school for ten months, "competent teachers," and to provide freely all the pupils of all grades with "all needed text-books and supplies." Mr. Draper evidently thinks the town is its own judge of what is necessary. Not so; the entire charge of the schools is in the hands of the school committee, who are independent of the town in the matter of expenditure. Save in building schoolhouses, the action of the committee binds the town. This has been established by the Supreme Court in one of its most famous decisions. If this is not compulsory support by taxation then the English language has no meaning which a lawyer is bound to respect.

The law which required all this to be done at public expense was passed in 1826. As early as 1766, however, a Province law required towns to raise money by taxation for schools, and since that time all schools have been so supported. When it is remembered that the schools of New York were not supported wholly at public expense until 1867, Massachusetts evidently took this step in advance.

The sixth and final step was compulsory attendance. Mr. Draper puts the date of the first Massachusetts law as 1873-

He mistakes a revision and strengthening of the law for the original enactment, which was in 1852. Here again Massachusetts did the pioneering. If any reader wishes a fuller exposition of this matter he will find it in Mr. Shaw's second article on "Compulsory Education in the United States," in the number of this REVIEW for June last.

In view of the facts here presented I reaffirm the statement made at Philadelphia, that each of these six steps was taken by Massachusetts in advance of the other States. I affirm that Massachusetts and not New York did the pioneering, and challenge denial with proofs.

Nor were any of these steps of small importance. Each one marked a substantial forward movement; and the principles involved together form the backbone of the American system of public schools. And the process is what I have called it, one of evolution. The whole future of the system was in the first enactment. Let any State decree that every child shall be educated up to a standard which it sets, and all the rest must inevitably follow—public schools, public taxation, public supervision, authorized teachers, and compulsory attendance.

As early as 1647 Massachusetts had a complete educational system, elementary schools, secondary schools, and the college, related to each other precisely in the same manner as similar schools are related to-day. There has been no break in the continuity of this system. There are public secondary schools which have been fitting boys for Harvard college for more than two hundred years, and these secondary schools have been fed by public elementary schools as long. And from the beginning this has been a public school system, all these schools being established and controlled by the people acting in their civil capacity. They were never established, supported, or controlled by the Church. The Church and the school were co-ordinate institutions established by, and subordinated to the town, which was a civil body politic. This system in its entirety, with its three grades, was recognized in the constitution of 1780:

It shall be the duty of legislatures and magistrates in all future periods of this commonwealth to cherish the interests of literature and the sciences and all seminaries of them, especially the *University at Cambridge, public schools, and grammar schools in the towns.*

The historical setting of this system is one of the questions involved in this discussion. The plans of Luther and Melancthon, as is well known, included in one or two places in each principality a learned school for preachers, pastors, clerks, and councilors for the whole principality. In all towns and villages good schools for the children should be established, whence those who were adapted to higher studies might be taken and trained up for the public. It was for the use of the children in these schools that Luther wrote his German catechism.

This scheme was substantially adopted in all the Protestant countries. The *First Book of Discipline*, prepared by John Knox for Scotland in 1560, ordained that every kirk should have one schoolmaster appointed, able to teach grammar and the Latin tongue. In the parishes of the Highlands the minister was to instruct the children in the rudiments and in the catechism. The *Book of Discipline* published in England by Cartwright in 1586 decreed that schools should be provided in which the children should be taught secular learning and the catechism.

In Holland the Synod of Dort—the same synod which manifested Dutch toleration by condemning John of Barneveldt for heresy—decreed that the consistories should establish schools not only in cities but in country places for teaching children the catechism. Under the influence of these appeals, schools, resembling each other in all important particulars, were established in every Protestant country. In Germany they were established by the princes, each in his own territory. In Holland in connection with the state Church, under the direction of the synods and consistories. In Scotland in the same way. In England they were established by voluntary endowment by individuals. In elementary schools little was taught beside reading and the catechism; in the

grammar schools, more advanced studies to prepare for the universities.

These ideas were the common property of all the Reformed Churches. Holland had no monopoly of them. The settlers of Massachusetts had been educated in the "petty schools" and the endowed grammar schools of England; the ministers and the early teachers had been graduated from the University of Cambridge. They immediately established the familiar Protestant system, with its three grades of schools, modeling them after those they had themselves been educated in. The ideal of the Reformers was universal elementary education. This was as true of England as of the continental countries. More, Cranmer, Ridley, Latimer, all urged it, and the New England Puritans set about realizing it at the earliest opportunity. Had the Puritan rule been permanently established in England the ideal would have been realized there. The preeminently independent condition of the Massachusetts settlers made it possible for them to embody in practice under public auspices the most advanced theories of the Reformation. And this was exactly what they did, under the limitations of new settlers in a new country.

When Mr. Draper says the masses in Massachusetts grew up in "dense ignorance" every student of history laughs in his face. When he jeers at the early New England schools for teaching the catechism he is jeering at the seventeenth century, for there was not an elementary school in Christendom, Catholic or Protestant, in which some sectarian catechism was not taught.

The contention that the American system of public schools has come from Holland, through New York, involves not only historical falsity, but logical absurdity. Boone in his *History of Education in the United States* says there was no public school system south of New England before the Revolution. If the American system has come from New York then something has come from nothing and the ancient proverb "*Ex nihilo, nihil fit*" is at last discredited.

But at the beginning of the present century every town in Massachusetts had dotting its surface, meeting the wants of

every child, however remote, elementary schools, absolutely free, supported by general tax, under control of the public authorities, and teaching branches prescribed by the law of the State. Such a school system the New England emigrants planted everywhere in the Northwest. In view of these facts, which are as well attested as any historical facts can be, Mr. Draper's final attempt at an *a priori* argument falls to the ground.

That argument is based on Mr. Draper's feelings and opinions concerning the early settlers of Massachusetts. As this is not history I have but a few words to say in reply. When he says he "has nothing but admiration for the dominant qualities of these people," and then goes on to say that "dense superstition" and "bloodthirsty intolerance" "dominated their lives," one wonders at the taste that can admire such qualities. When, however, he talks about their "lofty and heroic character," and "the magnificent part which that commonwealth has had in the development of our country," in the same breath with "dense ignorance," "dense superstition" and "bloodthirsty intolerance" it sounds like arrant nonsense. Men do not gather grapes off thorns nor figs off thistles. Dense ignorance, dense superstition, and bloodthirsty intolerance are not the stuff that lofty heroism is made of. If the lives of the settlers had been dominated by these qualities the commonwealth could not have had a magnificent or any other part in the development of our country. The structure which these people set out to rear would have crumbled in the raising, and their memory would have rotted, as it would have deserved to do.

These qualities may have "dominated the lives" of Mr. Draper's ancestors, who, he says, were among these early settlers. I am not prepared to deny this, but I do not believe it. On the contrary, I believe he maligns the past as grossly as he misrepresents the present.

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IV

EDUCATIONAL VALUE OF THE METHODS OF SCIENCE

I have not been invited to discuss the educational value of the sciences; that is fast becoming an axiom. I am only asked to consider the peculiar educational value, not of science but, of the methods of science—and I desire to show what I believe to be true, that there is something in the mere methods of science which makes them of peculiar, unique, and distinctive value as instruments of education.

I shall not dwell at length upon the peculiar educational value of the methods of the mathematical sciences, for this has long been recognized and admitted. Mathematics occupies already an honorable place in the curriculum, and its peculiar educational value is usually held to consist, broadly speaking, in the enforcement of purely deductive reasoning. But there is another aspect in which the methods of mathematics have peculiar educational value, and to my mind this is its most distinctive characteristic. It is, more than any other science, that which enforces the abstract as opposed to the concrete; and just here lies its strength and also its weakness as an educational instrument. In its method and its habit as well as its power of divorcing ideas from things, in its constant tendency toward generalization and abstraction, it possesses an educational value of a peculiar kind to an eminent degree. But this very peculiarity limits its educational availability to somewhat advanced periods of education. The habit of abstracting, or passing from the concrete to the general, the power of discovering the principle contained in the phenomenon, is likewise a feature of physical and natural science, and constitutes what might be called the mathematical element of the inductive sciences. But this method or process is certainly seen at its best in pure mathematics, because here it is com-

pletely removed in its subject-matter from the concrete; and so it is fair to say that the peculiar educational value of the method of mathematics lies partly in its availability for the enforcement of deductive logic, as seen, for example, in geometry, but chiefly in its enforcement of the power of abstraction, or the passage from the particular to the general as illustrated, for example, in algebra. It is doubtless because of these high functions, in which the methods of mathematics so greatly excel, that it has attained the educational importance which it possesses.

But the strength of the mathematical method is its weakness also. It is constantly seeking to depart from the concrete, and to pass over into the abstract. In this respect it differs completely from physical and natural science, which dwell chiefly upon things and allow their followers to generalize only upon condition that such abstraction shall be followed by strictest verification in further dealings with things. In so far as these generalizations become really abstract and are not limited to objects or phenomena, they resemble mathematical processes; but it may be doubted whether they are ever so far dissociated from matter as to really be worthy of the name mathematical. However this may be, there can be no question that the methods of physical and natural science are of much more elementary educational value than those of mathematics. Cases like Laura Bridgman's and Helen Keller's show what can be done in education by even the most imperfect means of connection with the external world. But if Dr. Howe and Miss Sullivan had been obliged to begin their teaching with the axioms of geometry or the abstractions of algebra, instead of simple objects such as they really used, namely, a doll or a pin, we should probably never have witnessed these, the most wonderful triumphs of all American education. Before leaving the subject of the methods of mathematics I cannot forbear to quote Bacon's opinions of their educational value: "They do," he says, "remedy and cure many defects in the wit and the faculties intellectual; for if the wit be too dull, they sharpen it; if too wandering, they fix it; if too inherent in the sense,

they abstract it." And in another place: "Mathematics make men subtill; natural philosophy deepe . . ."

Over against the mathematical, we may place the physical and natural sciences, with the peculiar educational value of whose methods I am here chiefly concerned, inasmuch as it is these subjects which are still struggling in some places for due recognition in the curriculum. It is these subjects, also, which bring the student into the most intimate connection with the modern views of nature and of man's place in nature. These are the laboratory sciences, while mathematics is essentially bookish. It is these which have justified the educational value of the methods of the gymnasium and the workshop; these which, by analogy as well as by physiology, have shown the educational merits of physical culture, manual training, and general handicraft; these which have demonstrated for all time that there are efficient instruments in the educational workshop other than the printed page and the voice of the teacher, other convenient and important avenues to the brain than the optic and auditory nerves, along which the teacher may work.

The physical and natural sciences, including physics, chemistry, biology, geology, and astronomy form a fairly homogeneous group known as the inductive sciences. They are broadly characterized by their extensive, though by no means exclusive, use of methods known as those of inductive logic.

The oldest of these, astronomy, may well serve as the bond of connection between this group and the mathematical. I shall reserve it as a most potent, because a most acceptable and familiar, witness to the peculiar educational value of the methods of physical science. It has long been a favorite instrument in the higher grades of education. But the drawback to the educational value of the methods of astronomy lies in the practical difficulty of applying them. The observations upon which astronomy is based are hard for classes to make, and require comparatively costly instruments. Moreover, the inductions of astronomy are difficult to verify, and involve the use of pure mathematics. These facts limit

the applicability of astronomy for the most part to the higher stages of education.

Before we can discover the peculiar educational value of the methods of the inductive sciences we must inquire: What precisely are these methods? The answer to this question, though brief, is the key to the whole situation. It is this: the methods of the physical and natural sciences are the methods of investigation. They begin with observations or experiments; advance to generalizations called hypotheses or theories; and finally proceed to overthrow or establish these generalizations by deducing from them their necessary consequences and rigorously testing them. This method involves inductive, as well as deductive, logic, and herein lies its peculiarity. Turning at once to its educational value, we may observe first, that this is the method which Nature employs. Every one of us has had the most of his education, already, along these lines. It is the method which the child unwittingly pursues before the school ostentatiously takes him in hand. It is this method, or some part of it, that the infant in the cradle follows who "spreads out his arms to the light." At first he only observes and experiments, but by and by he grows wiser and draws conclusions. If he still gains wisdom he learns—but how few ever reach this stage—to verify his conclusions. More often, Nature, his patient teacher to the end, completes the cycle, proving or disproving for him, happily or unhappily. Huxley has described this education by nature in his own way: "It is important to remember that in strictness there is no such thing as an uneducated man. Take an extreme case. Suppose that an adult man, in the full vigor of his faculties, could be suddenly placed in the world as Adam is said to have been, and then left to do as he best might. How long would he be left uneducated? Not five minutes. Nature would begin to teach him, through the eye, the ear, the touch, the properties of objects. Pain and pleasure would be at his elbow, telling him to do this and avoid that, and by slow degrees the man would receive an education which if narrow would be thorough, real, and adequate to his circumstances."

That most remarkable educational achievement of all our history, the education of Laura Bridgman by Dr. Howe, is thus described by Mr. Anagnos. "The first lessons were given by taking small articles such as a key, a pen, etc., having labels pasted upon them with their names in raised letters, and allowing her to feel of these very carefully, over and over again, until she came to associate the word thus printed with the thing itself; and when shown the name apart from the thing would at once bring the object which the name called for." (*Education of the Blind*, 1882.) We must not forget, in our admiration of the result here obtained, to give the credit which it deserves to the method employed. It was the laboratory method reduced to its lowest terms—the method of nature applied by a wise teacher.

But the method of physical science is not merely the method of nature. It does not stop with observation and experiment, but only begins with these. The experiments of Dr. Howe upon Laura Bridgman and of Miss Sullivan upon Helen Keller show how the teacher has it in his power to make objects generate orderly ideas; and Dr. Whewell long ago wrote as follows of the necessary connection of ideas with facts: "To the formation of Science two things are requisite: facts and ideas; observation of things without and an inward effort of thought. . . The impressions of sense, unconnected by some rational and speculative principle, can only end in a practical acquaintance with objects; the operations of the rational faculties on the other hand, if allowed to go on without a constant reference to external things, can only lead to empty abstraction and barren ingenuity."[1]

I wish to insist upon the importance of the generation of orderly ideas by the processes of observation and experiment, because I believe that much of the biological teaching of the day is as ineffective as it is, chiefly for the reason that it stops with an enforcement of merely visual observation. Observation lessons are hardly more than a diversion or amusement, unless the retinal images which they produce arouse

[1] Whewell, *History of the Inductive Sciences*, I: 43.

cerebral activity of an orderly and worthy kind. Observation lessons have no great educational value unless they generate ideas which shall bear fruit in clear thinking, accurate statement, intelligible descriptions, and some measure of comparison.

It is precisely this quality of the method, which, though rooted and grounded in a multitude of concrete facts obtained by careful observation and experiment, still insists upon an ultimate advance from these original observations to a recognition of their common properties—described or defined in generalizations or laws—that has given to the sciences employing it the title of inductive sciences. It may perhaps be true, as Jevons maintains, that the victories of science have come, hitherto, chiefly from the deductive side; but there is one movement, perhaps the greatest of all, which has overflowed the boundaries of science and enriched all branches of learning, and yet has come, not from the deductive but the inductive side. I refer, of course, to the doctrine of evolution. Lyell in geology and Darwin in biology are the great examples here.

In the Introduction to the *Origin of Species* Darwin says:

"When on board H. M. S. *Beagle* as Naturalist I was much struck with certain facts in the distribution of the inhabitants of South America and in the geological relations of the present to the past inhabitants of that continent. These facts seemed to me to throw some light on the origin of species, that mystery of mysteries as it has been called by one of our greatest philosophers. On my return home it occurred to me in 1837 that something might perhaps be made out of this, by patiently accumulating all sorts of facts which could possibly have any bearing on it. After five years' work I allowed myself to speculate on the subject and drew up some short notes. These I enlarged in 1844 into a sketch of the conclusions which then seemed to me probable, and from that period to the present day I have steadily pursued the same object."

This, from his autobiography, is also instructive:

"After I returned to England it appeared to me that by following the example of Lyell in geology, and collecting all

facts which bore in any way on the variation of the animals and plants under domestication, that some light might perhaps be thrown on the whole subject. My first notebook was opened in July, 1837. I worked on true Baconian principles and, without any theory, collected facts. . . "

These statements from a leader in the method of induction exemplify the patience, the persistence, and the reserve in speculation which this method demands. "After five years' work I allowed myself to speculate on the subject," writes Darwin.

Another characteristic of the methods of the inductive sciences is their broadening power, and in education there is none more important than this. Any subject which can furnish a really sound, yet broad, training of the faculties is worthy of most serious consideration; and by virtue of their method I claim that the inductive sciences may do this. Observation and experiment; inference and generalization (induction); deduction and verification, by further experiment if need be—where is another instrument of education in breadth like this? And then the sanity which it tends to develop; facts at the beginnings and proofs at the end; speculations controlled; vagaries checked by tests; yet sound speculation rewarded and flashes of genius welcomed, if only they prove to be in harmony with truth.

There is still another respect, however, in which the methods of the inductive sciences are peculiarly valuable as educational instruments. It is their fundamental simplicity due to the fact that they deal, in the last analysis, with concrete objects or facts. The handling of an insect by a schoolboy full of curiosity and keen in observation differs, in method, in only a very slight degree from the examination of the same specimen by a professional naturalist. A thermometer may be read by a schoolboy after one lesson as attentively as by his teacher. A rare plant may be discovered as successfully and as triumphantly added to an herbarium by an beginner as by an expert. The one indispensable requisite in this method is intelligent observation or experiment upon something.

But while it is granted that the method of the inductive sciences has peculiar educational value because it is the method employed by nature; because of its compelling contact with the external world; because of its broadening process in enforcing inductive, as well as deductive, logic; and because of its dealings with concrete objects or facts; it may be urged that it is no longer the exclusive property of science, but has become the true method of inquiry in history, in politics, in philology, and in nearly every modern branch of learning. This is true; and it will be observed how powerful a witness to the real character and value of the method is the phraseology used to describe it in these cases. It is always the *scientific method* in politics, or history, or philology that is urged as most worthy, by the modern disciples of these subjects. No better testimony could be desired as to the origin of this method and its fittest abode. One of the greatest services that science has ever done is to discover and popularize the model method of research which all branches of learning have hastened to adopt, and whose adoption has brought about the scientific spirit of this age.

But it may also be urged that if, as I allow, the scientific method is now by no means confined strictly to physical and natural science, but has infected all other branches of learning, these may suffice quite as well to enforce it, and that in fact by the very change of front of the older subjects of the curriculum our object, if it be to secure the method, is already accomplished; science is not needed because the classics, for example, have become scientific in their philology. The argument has point, but it fails to satisfy; and for this reason. If the method has educational value wherever used, it has its peculiar and superlative educational value in those subjects which gave it birth and which are best adapted to it. Physical and natural science should be taught in the schools for many reasons, but chiefly because they are better adapted than any other subjects to illustrate and enforce scientific method.

The principal reason why the physical and natural sciences

are better adapted than any other branches for the teaching of the inductive method is that this method begins with facts based upon personal observation and experiment, and facts of this sort are more abundant and more trustworthy in external Nature than elsewhere. In the inductive sciences, also, there may always be an abundance of direct, first-hand, personal observation and experiment, of which the importance in education cannot be over-estimated, for it is actual personal intercourse with Nature. The student of history, on the other hand, even when he has access to the original documents, is obliged to depend more largely for facts upon the reports of observers, perhaps of small observing power or doubtful veracity; or upon documents, perhaps well conceived but poorly executed, or few in number or ill-preserved. Again, the possibilities of experiment are wholly wanting, while those of verification are very limited. Moreover, mathematics begins with axioms, and history with recorded facts. But botany begins with plants. Axioms and recorded facts doubtless agitate the cerebral protoplasm; so, also, does a rose. But axioms and recorded facts throw no color images upon the retina; no fragrant waves upon the nerve ending in the nose; no pressure on the finger tips. Roses grow from the soft earth, and bud and blossom and decay. Axioms and recorded facts live on only in books and in the minds of men, unchanged forever.

In so far as history, economics, and linguistics can employ the method of physical and natural science, in so far are they like it in educational value. Hence, I believe, has also come the most of their increase of power and efficiency of recent years. But the trouble is that they are after all but ill-adapted to the method. Even when these subjects lend themselves to the direct observation of phenomena and proceed to the next step, namely, generalization, they often fail completely in the third stage or that of verification. For example: Wages rise or fall; it is claimed that this was due to special legislation. But the proof of this is so hard to find that one large party holds one opinion as to it and the other the

exact opposite. The trouble is that the scientific method cannot be applied here. If it could, we should make a series of rapid legislative experiments—first in the one direction, then in the opposite—while all other conditions should remain the same, and then carefully compare the results. But such rapid experiments for verification are always impossible, even in the kaleidoscope of American politics. Napoleon was defeated at Waterloo. Various theories are advanced to explain why, but none of them can be verified in a class room. It is impossible to reproduce a battle in a schoolroom or to witness the growth of a nation. But, on the other hand, a piece of ice melts into water before our eyes. On reflection we remember that most ice about us melts with the advent of spring. Some, however, is kept through the summer by being carefully covered and secluded. On the other hand the winter is the season when ice forms out of doors. A cool place also seems to preserve ice. A possible theory to explain all of these phenomena is that ice cannot long endure in the presence of high temperatures, but is conditioned by cold. The theory appears to explain the facts. But we must verify it. If we apply heat directly to it, the melting is hastened. If we apply cold, it is checked. We can even generate ice from water by making the latter cold enough; and we can do all of these things in any class room.

The student of history begins with the spoken word or the printed page. Impulses undoubtedly flow in upon the brain along the visual or the optic tracts; but the stimulus is not the real thing itself. It is a description of it by an interpreter or upon a printed page. I disagree entirely with the authority who claims that "Mommsen's *Rome* is as thoroughly scientific as any of Darwin's work." It cannot possibly be so, because the essence of scientific work is personal observation and experiment. And just here is the reason for the dismal failure of merely text-book work in science; it is dead at the very root.

The modern laboratory is a workshop in which natural conditions can be imitated or controlled. It is a selected and

concentrated portion of external nature. And always, in the laboratory, students must be doers and not hearers only. We still need text-books; but the laboratory has come because it does away with the reporter and brings the student face to face with nature. In order to avoid all possible misunderstanding, however, let me repeat at this point what I have already said, namely, that, in so far as such subjects as history, economics, or language demand or permit the use of the methods of science, I hold that they also possess in greater or less degree the same peculiar kind of educational value as the physical and natural sciences. And to show that I am no bigot, though an earnest advocate of the peculiar educational value of the methods of science, I may add that I fully believe that art, music, poetry, and literature have their own peculiar educational values, but values of a wholly different kind from those of the inductive sciences. I also believe that those parts of history and language which cannot be said to be scientific have their own peculiar educational values. But with these I am not now dealing.

Some look upon education as a kind of horticulture, and upon teaching as mere culture of the mind. Nature, they say, gives food and energy to the growing plant; the teacher can at best but bring the food and water and, except perhaps for bending or pruning a little now and then, must leave the rest to nature. But I think that the analogy is false, for it fails in this: it substitutes the plant for the animal, the relatively rigid for the relatively plastic, the adult for the adolescent. As a biologist and a teacher, I doubt the validity of the analogy. We do not talk of "cultivating" animals but we do of training them, and the spirit of this age asks for an education in which there shall be more of a training adapted to animals and less of a culture best adapted to plants.

The most disquieting fact that I know of in American education is the unsatisfactory result of our secondary education. This becomes apparent every autumn when the new classes enter our higher institutions. The incapacity amounting almost to paralysis and the intellectual rawness which the average fresh-

man exhibits mean either that the American boy of eighteen is exceptionally immature or else that he is untrained. There is a growing conviction that he has had too much of the horticultural in his education and too little of real and virile animal training. Training implies the power of *doing*, the power of definite, orderly reaction to stimuli; but the reactions of most American freshmen are painfully indefinite and disorderly—except to stimuli applied in the well-appointed laboratories of athletics. I firmly believe that the remedy for this unsatisfactory state of things lies in a more natural method of secondary education. We must have more of physical and natural science; more, especially, of Nature, more of its substitute, the laboratory. So long as we had but little science on the higher rounds of the ladder, the defects which are now so conspicuous were unobserved by educators. The plain people saw that education above the three R's meant only what they called, and rightly called, "book learning." But they were assured by those in authority that the strange and often grotesque results which they witnessed really meant something very wonderful, and so they submitted. To-day all this is changed. Authority in education is losing its force, and the cry is—"By their fruits ye shall know them."

But in this wholesome decline of respect for mere authority and convention we are brought face to face with a new danger. Because those who should have been wise have conspicuously failed to keep pace with the progress of the age, we are threatened with educational anarchy. Every school committee is now a law unto itself. Estimable citizens, experts in other subjects, it may be, but often wholly wanting in educational wisdom and with no knowledge of the theory or the history of education, are now shaping our curricula. Worst of all, the curriculum of youth is beginning to be sacrificed to factional purposes. The curriculum can never be wholly inflexible. I believe that it should reflect the progress of the age; but that it should be surrendered to the uses of even a worthy faction, I do not believe. Yet such a faction now holds the subject of physiology bound hand and foot, for the

sake of the teaching of temperance in the use of alcoholic drinks.

That ideas of evil habits are officially communicated to innocent minds; that facts are strained and false conclusions or half-truths are taught, is bad enough. But these are mere trifles compared with the capital offense, namely, that the curriculum has been sacrificed to a faction. Let us have it distinctly understood that if it is contemptible for politicians to attempt to control the teaching of political economy in our colleges and universities, it is much worse for us to allow partisan, religious, or moral fanaticism to fix the curriculum for the young. Let us make the curriculum our educational constitution, subject to amendment indeed, but only after long debate and with the approval of experts. What we need most, to-day, is competent expert authority in education. A city leaves its water supply and sewerage to experts; why not its education, also?

The most serious practical difficulty in demonstrating the educational value of science is the fact that so few are really qualified to teach the several subjects required; I regret to have to say it, but it is no uncommon thing for a teacher of zoölogy or physiology in the public schools to confess to me that she is ignorant of the subjects which she teaches. There is danger therefore lest these subjects shall fall into contempt from bad teaching. It must be squarely recognized that the requisite preparation for teaching physical and natural science cannot be obtained from books, or from brief courses of manipulation or dissection. The methods of science are laborious and comparatively expensive; they absolutely require the most skillful teachers to apply them, and there is no use in any halfway measures. But in spite of all this, they are simply indispensable in modern education. In my opinion no one can be really qualified to teach any one of the inductive sciences who has not had at the very least one whole year of preparation in that subject, with constant laboratory work. I find, moreover, that teachers of these subjects are sometimes but poorly provided with material for class work by the

authorities. All of these things tend to produce poor results and to prejudice the entire subject. To those who desire an expert opinion on the subject of natural science teaching, by one who is not a partisan, I strongly recommend an essay, now more than ten years old but still timely, by Dr. J. G. Fitch, one of Her Majesty's Chief Inspectors of Training Colleges. It can be found among his *Lectures on Teaching* delivered in 1880 at the University of Cambridge, England.

If, in conclusion, I may attempt to summarize the peculiar educational value of the methods of (inductive) science, I shall do so as follows:

(1) The methods of science involve the whole method of investigation and inquiry. They consist of three principal, successive, and interdependent processes, namely, (*a*) observation and experiment, (*b*) inference or generalization from the previous observations or experiments, and (*c*) deduction, from this generalization, which must be submitted to further experiment or observation for final verification. These methods, therefore, are of peculiar educational value on account of their remarkable breadth and scope.

(2) The methods of science have peculiar educational value because they are the natural methods.

(3) The methods of science possess peculiar educational value because they require personal intercourse with Nature, and impart knowledge first-hand, from concrete objects or phenomena.

(4) The methods of science involve the constant use of the senses as well as the imagination and the reason. With science properly taught it becomes possible "to send the whole boy to school."

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V

TESTS OF THE SENSES AND FACULTIES

Tests of the senses and faculties concern the teacher from three points of view. In the first place, those who wish to contribute to the advancement of psychology will find here a convenient opening. In the second place, such tests give a useful indication of the progress, condition, and aptitudes of the pupil. In the third place, the carrying out of the tests might serve as a means of training and education.

The senses and faculties have been studied hitherto by men of science, who have mostly made the determinations upon themselves. This is a necessary beginning, but now that methods have been elaborated, it is very desirable that the measurements should be extended so as to include different classes of persons. There are no individuals better suited for such experiments than the pupils in our schools. They are classified according to age, acquirements, and sex, and the teacher has considerable knowledge of their ability, character, and heredity. A careful investigation of the variation in the senses and faculties under such conditions would at the present time be an important contribution to science. In so far as experiment can be used in the study of mind, scientific progress is assured. The traditional psychology is vague and inexact, and cannot rank as co-ordinate with physical science. But when we regard the history of the several physical sciences, we see that they too at one time consisted of inexact descriptions, artficial classifications, dubious anecdotes, and verbal explanations. With the introduction of experiment and measurement astrology has become astronomy, alchemy has become chemistry, and natural history has become natural science. Physical sciences, such as astronomy, in which measurements could be readily undertaken were the first to be developed, while those, such as electricity, in which it is

difficult to make measurements, are still backward. Matter in motion is more readily subject to experiment when passive than when organic and living. Physics has consequently preceded biology in its development. But the progress of biology has recently been rapid, and it will be found that nearly all advances have been due to the application of experiment and measurement. As the living organism is more complex and changeable than inert matter, so the mind is more complicated, protean, and inaccessible than the body. It is natural, therefore, that psychology should be the last science to be weaned by philosophy and to begin an independent growth. Those who have followed the recent development of psychology know that this has been the result of experiment and measurement. Each new application of experimental methods subserves the advancement of psychology, and the very backwardness of the science gives the teacher an opportunity to contribute to its progress.

When our knowledge of the normal variation of mental processes has been somewhat further increased, its determination will give useful indications of individual condition, progress, and ability. In conjunction with the ordinary school examination such tests would show whether the course of study is improving or blunting the fundamental processes of perception and mental life. Tests made at the beginning and end of the day, week, and session would show whether the student is exhausted by the required curriculum. They could be used in comparing different systems of education, different schools, the advantages of city and country, etc. They would show whether girls are able, without injury to health, to follow the same courses of study as boys. Careful tests must almost of necessity be introduced into the public schools. If attendance be made compulsory, the state is undoubtedly responsible for any bad consequences which could be avoided. Thus if the eyesight of a student be injured, so as to involve a loss of ability to earn a living, the state would, under our present laws, probably be liable for damages. In many cases tests which could readily be made would indicate disease, especially

of the nervous system, long before it becomes apparent to common observation. The tendency to certain diseases counter-indicate certain employments. Thus a very large percentage of women teachers become insane; consequently those having neuropathic tendencies should not enter on this profession. One boy in twenty is color blind, and this defect, which is never discovered by the individual himself, but may be determined by the teacher in one minute, unfits him for work so far separated as that of the railway signal man or of the artist. As our knowledge increases we shall, on the one hand, be able to indicate very early in the life of the child tendencies to insanity and other diseases, to dipsomania and other vices, and to crime, and precautions may be taken which will limit the range of these abnormal tendencies in the individual, and prevent their spreading in the race. On the other hand, valuable qualities may be early discovered and developed. Special aptitudes will not be lost through unsuitable surroundings and uncongenial work, but the child may be led to the course of life in which he will be most happy and most useful. Many tendencies are likely to be eliminated or increased in offspring according to the marriage of the parents. While instinct is probably a better guide to suitable marriage than scientific principles, it cannot be denied that parents and the conventions of society have much to do with the conditions under which choice is made. Somewhat of the backwardness of the dark ages may be due to the fact that many of the best men were celibates. If a code of honor (such as obtains in some aristocracies, and prevents its members from marrying below their rank) could be developed, and directed toward eliminating degenerative tendencies, and developing valuable traits, the race would be greatly strengthened and perfected.

Such experiments on the senses and faculties would not only advance our knowledge of the mind, and serve as a useful criterion in many ways, but they would also be a valuable training for the pupil. The senses and faculties would be developed as well as measured. In the child and savage every sensation from without is apt to distract the attention and

lead to some movement. In the language of physiology, afferent impulses are immediately converted into efferent, and nothing is stored up within. Education seeks to prevent such dispersion, and the importance of manual training and laboratory work for this purpose is now universally admitted. The senses and faculties are trained wherever the student makes special movements and independent observations, but the direction in which these should be undertaken remains an open question. It should be remembered that a laboratory course, as in chemistry, is intended rather for training the pupil than for learning about the combinations of elements, etc. It is, in fact, a course in experimental psychology as much as a course in experimental physics. It can only be decided after practical trial whether a laboratory course expressly directed to studying the senses and faculties would serve better or worse than a physical or biological science as a means of training. Such tests certainly require the most complete abstraction and concentration, and every wandering of the attention is at once betrayed by the experiments themselves. The stimulus of competition and of the effort to improve will certainly secure the interest of the student. It may be found that the experiments will become too much of a "game." But they require a steady hand, undimmed senses, and a clear mind, and any effort to secure these cannot but benefit the student. Those who have marked the improvement in health of students in the English universities as they train for a boat race must wish that some such healthy competition could be more widespread in schools and colleges.

In this paper suitable tests can be indicated only; the teacher who wishes to study methods and results must work over special books and papers.[1] Experiments can be made in an hour which would leave a record of permanent value both to

[1] We are fortunate in having the recent psychologies of Professor James and Professor Ladd. Those who know German should also read Professor Wundt's *Physiologische Psychologie*. Mr. Galton's *Inquiries into Human Faculty* and other writings are of special interest. Professor Jastrow has given in the EDUCATIONAL REVIEW (II : 442) an excellent example of tests on memory and association.

science and to the individual student. If the experiments be regarded as a means of training and made part of the school curriculum, and an hour a week throughout the year be devoted to them, much more can be accomplished. In this case the senses may be taken up in order, beginning, say, with vision. The sharpness of sight may be easily measured by determining the distance at which a printed page can be read. If the sharpness be defective an oculist should be consulted, as the difficulty is usually mechanical and may be readily corrected. Each eye should be tested separately, as one eye is often defective, and an excess of strain is needlessly thrown on the better eye. Color blindness may be detected by letting the student select all the green shades from a heap of colored wools, and more exactly determined by matching colors on revolving wheels. The size of the field of vision may be mapped out by letting the observer look at a fixed point and determining how far in every direction letters can be read and colors seen.

The error in perceiving size may be tested by drawing a line as nearly as possible the length of a standard line, and in perceiving intensity by matching shadows or revolving wheels. The perception of size, distance, and solidity with one and with two eyes may be studied, and its exactness measured. If time permit contrast and after-images may be observed, and the individual variation determined. Useful training in subjective observation may be obtained by noticing that things not looked at directly are seen double, and by observing entoptic phenomena. These are various images due to the structure of the eye. They are often discovered by the individual, and lead him to think that his eyes are failing.

The sharpness of hearing may be tested by determining the distance at which the ticking of a watch can be heard. The test should be made for each ear separately. The range of pitch which can be heard varies considerably with different individuals, and this may be determined. The accuracy with which small differences in pitch can be distinguished and with which intervals can be adjusted should be measured. Time is often misspent by girls who learn to play the piano mechan-

ically with no ear for music. The exactness with which distance and direction can be recognized with the ear may be measured. Learning to distinguish the simple tones in a complex sound is a useful training.

Touch may be tested and trained by determining how far apart two points must be in order that they may be recognized as two when they touch the skin. This distance differs greatly in different parts of the body. Taste and smell are neglected senses, and ones peculiarly open to education. Considering its importance to comfort and health, cooking is a backward art, and our housewives should be trained to distinguish and value small differences. If good water could be distinguished from bad by the average individual as well as it is by the horse, many cases of typhoid fever and diphtheria would be avoided. The same holds for smells, which are invaluable criteria of unhygienic surroundings. The sense of temperature could also be trained so that one may know when a room becomes overheated, and may distinguish subjective from objective causes. The organic changes within the body are obscure and not easy to observe and study, but they are of enormous importance. To recognize correctly the need for fresh air, food, sleep, rest, and exercise would be an acquirement whose value cannot be overstated. If the causes leading to *malaise* and *bien être*, tedium and comfort, could be learned and the mode of living adjusted accordingly, the value of life and all the institutions of society would be affected.

Movement and its perception offer a valuable series of tests. The strength of the grasp of the hand and the rate at which a blow can be struck should be measured. These are convenient tests of bodily condition, and a difference between two hands is often characteristic. The tremor of the hand and the sway of the body give early and important indications of overstrain. The way we judge movements by their extent, their force, and their time should be studied, and the accuracy of discrimination measured. It is easy to find how much difference there must be between two weights, in order that their difference may be noticed.

Feelings of pleasure and pain may be tested in such a course, and possibly elementary æsthetic perceptions trained. It would be a great gain if students could learn to appreciate simplicity and taste in dress and surroundings. The colors and their combinations liked best and least may be determined, as also shapes, relative sizes, etc. A corresponding experiment may be made for the combinations of tones used in speech and music. The pressure or temperature which just hurts may be determined.

Leaving the senses and turning to the faculties we find that imagination, memory, and the association of ideas may be tested. Thus a series of questions can be framed the answers to which will throw light on the mental imagery of the pupil. The thoughts of some are accompanied by vivid pictures, others think more in sounds or movements. Some can call up a scene so as to see all the details before them, others only remember the relations. Such differences are highly characteristic, and indicate special aptitudes which should not be disregarded. The accuracy of ordinary observation may be tested by requiring the student to draw the plan of the hall of the schoolhouse, or to give an account of some event, say something that happened in the school the day before. Casual observation will be found very defective, and the student will learn that but little reliance can be placed on stories of extraordinary events, or even on the testimony in a court of justice. He may also learn to distinguish clearly what he in fact knows, and what he surmises and invents. If so he will have acquired nothing more valuable in his whole school course. Memory may be tested by reading a passage aloud, and requiring the student to write down afterward as much as he can remember. It can be measured more exactly by reading a series of numerals, and determining how many can be remembered. The experiment may be varied by choosing a series of numerals greater than can be remembered on hearing once and determining how often it must be repeated in order that it may be learned. The same series may be used a day or a week afterward; the greater rapidity with which it is learned

indicates unconscious memory, and the experiment may be arranged to measure the rate of forgetting. The rate at which a simple sensation fades from the memory may also be determined. The range of consciousness may be measured by uncovering objects for a very short time and determining how much the student can perceive simultaneously. The association of ideas may be studied by giving a word to the class, and letting them write down what idea or other word is suggested by it. The train of ideas for twenty seconds may be recorded. Questions may also be arranged in such a manner that the answers will throw light on the acquirements and interests of the student.

The time of mental processes is a useful test. The accuracy with which an interval of time can be judged is a somewhat different matter; it may be tested readily by giving the student an interval, say one minute, and letting him note when an equal period has elapsed. The time passing before a movement can be made in answer to a stimulus may be measured, but it is so short that delicate apparatus is required. The time needed to see and name series of colors, letters, and words should be found. An educated man can read words making sentences in about half the time that he can read disconnected words. The absolute and relative times are consequently a good test of progress in learning to read. The rate of reading foreign languages measures familiarity with the language. The time of mental processes, such as translating words from one language to another, adding or multiplying digits, remembering the country in which a city is situated, or the author of a book, may be measured readily by letting the student make ten trials in succession. The time in coming to a decision or in making a judgment may also be measured. In normal mental life the attention waxes and wanes and the duration of this rhythm may be measured.

In conjunction with these mental tests certain anthropometric data should be secured. Such are the height, weight, breathing capacity, the color of eyes and hair, etc. Age and sex and the nationality and position of the parents should

always be noted. If possible it will be well to record what diseases the student has suffered, as also the age, state of health, etc., of his brothers and sisters, his parents, and other near relatives.

This series of tests of the senses and faculties by no means exhausts such as may be made to advantage. Those wishing to undertake more advanced work will seek to study and measure mental time, intensity and extensity, and the correlation of these magnitudes. But all the tests enumerated here may be made by an intelligent teacher on even the youngest school children, and without expensive or complicated apparatus. It may seem surprising that, with the exception of a few isolated tests, this has not as yet been attempted anywhere; but it must be remembered that experimental psychology is a recent study even in our universities. The first laboratory for research work was established by Professor Wundt at Leipzig in 1879, and the second by Dr. G. Stanley Hall at Baltimore in 1882. The first course in which students carried out a series of experiments in the laboratory was given by the writer in 1888. Now, however, the teacher can prepare himself for such work in most of the leading universities—at Harvard, Yale, Columbia, Pennsylvania, Cornell, Clark, Brown, Washington, Chicago, Wisconsin, Michigan, Indiana, Nebraska, Stanford, and Toronto. The rapid extension of the study of experimental psychology in American universities leads to the expectation that tests of the senses and faculties will soon be undertaken in many schools, and will perhaps be made part of the regular curriculum.

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VI

LIFE IN A FRENCH LYCÉE

In France the secondary schools that are directly ruled by the state are termed Lycées. The purpose of this sketch is to give the English and American reader an idea of the chief characteristics of a Lycée such as that in which the writer was educated. In what follows I have confined myself to the reminiscences and experiences of my own school days.

Doubtless many an English and American excursionist in Paris when visiting the student quarter of the city, under the guidance of a "Cook's agent," has had his attention called to a huge, square building, just behind the monumental mass of the Pantheon, with a ragged old tricolor floating in front of it, and been told that it was the Lycée Henri Quatre, or Henry IV's school.

The foreign visitor when contemplating this dark, massive building, and looking at the heavy iron gate of the entrance, must have pitied the poor boys shut up behind those gloomy walls. If such a visitor, being endowed by nature with good, active legs, should climb the long staircase which leads to the top of the Pantheon, he would get a bird's-eye view of the school buildings spread out below him, he would see quadrangular courtyards, planted with languishing trees, surrounded by high, dark buildings. On one side of those buildings he might see something resembling a small park or rather a large garden; and his eye having rested pleasantly on its "leafy tide of greenery" he would go home and perhaps say to his children that in France boys are very happy, for they are provided with fine gardens to play in. How far he would then be from suspecting the truth!

But let us go in through the small side door. We have not made two steps before we are stopped by a porter who asks us what business we have in the school. But we will sup-

pose that he allows us go on. Leaving the porter's lodge behind us and a big room called the *Parloir*, let us go round the *Cour d'Honneur*. It is a square yard ornamented with some flowers, and with two busts of famous men who have been educated in the school. Around it runs the vaulted roof of a cloister, as in a convent. Indeed the Henry IV's school has been erected on the site of an old convent, the only remains of which are this cloister, the chapel, and a square tower called the Clovis tower, after the early Frankish king. The old cloister is nowadays "The Yard of Honor." Leaving it we go through long corridors, and through four courtyards, those seen by our visitor from the top of the dome of the Pantheon.

If we happen to enter one of those yards when some of the boys are occupying it we shall see them walking in platoons of twenty to twenty-five, two and two, and in step, under an usher's watchful eye. Indeed a boy is never allowed to go through the school buildings by himself, even though the distance be not more than ten yards. If, for instance, he happens to want a book which is in the possession of a boy in the next room, he must have what is called a "*laissez passer*" (pass), which has been signed by his own usher, and will be countersigned by the usher of the other room.

Everything in a French school is regulated by strict discipline, and to put its rules into practice there is a whole army of overseers. At the head of the army is the *Censeur*, who has the superintendence of all the boys; but as he cannot very easily give his attention to every boy's conduct, the whole school is divided into two colleges—that of the little boys, including the sixth, seventh, eighth, and ninth forms; and that of the big boys, subdivided into three colleges, which includes all the forms from the fifth to the rhetorical, philosophical, and mathematical forms. At the head of each of these four colleges is a *Surveillant*, who has a private study of his own, but whose duty it is to visit the boys' schoolrooms as often as possible. He superintends their meals, and knows all the boys of his college by name. He is in fact a second *Censeur*. During recreation time the boys are attended by a

special usher, called the yard-master, *Maître de Cour*, who is there to prevent any of those mischievous tricks which boys are apt to indulge in when in a state of semi-freedom. Lastly, to watch over the boys in the schoolrooms, there is the usher, the "*Pion*," as he is denominated in the scornful slang of the school.

As a rule the *Pion* is a poor young man who, not having sufficient money to go on with his studies, has pledged himself, as a private student, to serve the government for ten years. In exchange for his services he is provided with lodging, food, books, a very small income, never more than $250 per annum; and he is allowed to attend the university lectures without paying any fee. This can scarcely be deemed generosity on the part of the French government, because this young man has simply pledged himself to a life of slavery. Slave of the *Surveillant*, who unceasingly controls his actions; slave of the *Censeur*, who often finds fault with him on the former's report, for his lack of severity or for some trifling breach of the school rules; slave of about twenty-five boys who, being under his watchful eye all the year round, take every opportunity of teasing him; slave of his university professors, who report him to the Ministry of Public Instruction if he does not attend their lectures regularly—the *Pion*, as Victor Hugo has said in a splendid piece of poetry, is the martyr of modern civilization.

In fact, however, the poor usher's life has been ameliorated by the government of the Republic, which has done so much (and I think everyone ought to give it due praise) for public instruction. There are now assistant ushers who take the *Pion's* place once a week; thus he is allowed a day's rest regularly. We have already seen that during the recreation a yard-master takes care of the boys. Add the class hours to these moments of freedom (for the usher does not teach the boys; this is done by a specially appointed professor) and you will see that since Victor Hugo's powerful lines appeared, *i. e.*, since 1842, the *Pion's* position has been much improved. It must be remembered, however, that dur-

ing these four or five hours, if free from his *Pion's* duties, the young man has to attend two or three lectures, so that his leisure hours are few indeed.

It is under the *Pion's* immediate guardianship that the boys go through with their daily exercise. At half-past five in winter, and at five in summer, the loud beating of a drum awakens all the boys, who must be dressed and ready in their schoolrooms half an hour later. A quarter of an hour before the drum sounds the *Pion* (who sleeps in the same room as the boys, in a bed placed on a kind of platform in a corner of the room, and hidden from the boys' sight by a plain yellow curtain) has been awakened by the serving-man, whose business it is to take care of the boys' clothes, to make their beds, to bring in the plates and dishes at meal times, and to clean the rooms. There is one servant to each class room. A class room accommodates about twenty-five boys.

Till 7.30 the boys learn their lessons by heart, and recite them to their *Pion*, who gives a mark to each of them. At 7.30 the drum calls them to the refectory, where they eat a plateful of soup. Then they go to their courtyards for a short recreation till eight, each of them having found by his place, close to his plate, a big piece of bread. Some eat it dry, others eat it with some chocolate which they have brought from home, others buy some jam from a kind of confectionery and toy shop which is opened at playtime in each courtyard; this boys in England would call a "tuck-shop."

At eight o'clock the boys fetch their books from the schoolroom and go into the class room. The usher, who has taken his breakfast with them, has had like them his piece of bread, and has left them only in the courtyard, now goes with them into the class room, and does not leave it till the professor comes in. Then all the boys, who have been pretty noisy before, stand up out of respect for the professor.

The schoolroom where we have seen the boys learning their lessons is furnished with long tables and forms running around the room; along the wall, behind them, is a row of cupboards for the boys to put their books in, and a chair at the

upper end, from which the usher can peep out at his boys. In the class room the arrangement is entirely different. There we find low forms and narrow tables raised one above the other and fronting the professor's chair, but without any desk or cupboard, since it is only intended for class time. The class room is rather uncomfortable, with its narrow, flat tables just large enough to put the copy books down upon, but allowing the professor to see all his pupils at a glance and watch all their movements. The boys remain there from eight till ten, while the professor sees how the lessons have been learned and prepared, corrects the exercises—in a word teaches the boys the different matters they have to learn in the course of the school year.

A very short rest is allowed from ten till a quarter past ten, after which the boys go into the schoolrooms till noon, when they have what the English would call lunch, but what is in fact their principal meal and is called in French *diner*. Of course the usher is with them once more. He has taken them out of the class room, has seen them bring their books back into the schoolroom, and has taken charge of them again at the end of their quarter of an hour's playtime.

From 12 to 12.25 the boys and ushers eat their lunch: soup, meat, vegetables, and twice a week dessert of some sort (pastry, cheese, or fruit, according to the season), a glass and a half of "eau rougie," *i. e.*, water mixed with wine; and of bread, salt, and water as much as they want. There is a refectory for each college, so that each room for meals holds about 150 boys. Ten boys sit at each table. The tables are of marble, five on each side. At one end sits the usher, who is waited upon by the servant, apart from the boys, but he is served with the same courses as the boys—the only difference being that he is helped more abundantly than they. As for the boys, they help themselves in turn to the dishes that are laid on the tables. Formerly no talking was allowed during the meal. They now talk at meal time, and as the usher could not easily watch over the two or three tables which are occupied by his own boys, the *Surveillant* is there, who,

besides watching over the boys, has to say grace, and to deliver them their letters. It will be a surprise, I am sure, to learn that no letter is given up to the boy to whom it is addressed unless it bears on its back the sender's name, which name has been previously registered as that of a person whom the boys' parents allow to write to their son.

When the meal is over, the boys are taken to the courtyard, where they enjoy the longest playtime of the day, for it lasts a full hour, from 12.30 till 1.30.

Then comes work for three hours, of which one is devoted to learning and reciting lessons in the schoolroom as in the morning, and the other two to another class. If the morning class has been devoted to history, or Latin, or Greek, or French, then the evening class is given up to mathematics, German, or English, etc.

When 4.30 comes, the boys are allowed another three-quarters of an hour's playtime and are given a piece of bread as in the morning. If they are thirsty they may repair to a pump in the yard; no other provision by way of "tea" is made for them.

From 5.15 till 8 the boys are kept in their schoolrooms, where during nearly three hours they do their exercises. It is the longest and also the best employed and most profitable study time which the boys get. The day is practically over; they are not likely to be disturbed by anyone or by any unforeseen event; everything in the school is quiet, and the studious boys may then indulge their taste for learning quietly and steadily. The lazy boys are kept silent by the usher's presence; if they do not pay so much attention as their studious neighbors to their tasks they are at least obliged to go through them, and so are unable to disturb their more zealous fellows.

At 8.15 the boys who are not fifteen years old are sent to bed, while the older ones, if they choose, may get an hour more for finishing their tasks, till 9.30, when everyone, boys and ushers, goes to bed.

The diversions from this monotonous existence are not very numerous. First, there is a three hours' walk on Thurs-

days, in the afternoon, when the boys put on their best clothes, a kind of military uniform very much the same as that of the English postman, and are taken by the usher, walking in order, two and two, to some place in the city, where they have a half hour's rest, and then return to school by 4 P. M. They then put on their everyday clothes again and resume their ordinary life, with this difference: they are allowed during Thursday evening study time to lay aside their lessons and tasks and to read entertaining books.

I must say, by the way, that most of the bigger boys do not even enjoy this weekly walk, as they are allowed, in consideration of the examination they have to prepare for, to stay at school, and have a long study time instead of the walk.

The other chief diversion is the *Parloir*, that is to say, twice a day during the playtime, at 12.30 and at 4.30, parents and friends are allowed to see the boys in the *Cour d'Honneur*. The visitors have to give their names to a master who is put for that purpose in the *Parloir* or drawing room, which one passes when entering the school. Having received the visitor the master then sends a servant to call the boys out of their courtyards.

Then there is the weekly or fortnightly Sunday *sortie* or holiday. It is only every other Sunday that the holiday is *générale*, *i. e.*, for all the boys. On other Sundays those boys only leave the school who have received a certain number of good marks. Every boy under seventeen years of age has to be fetched by his parents or by someone duly authorized by them, and brought back before 10 o'clock at night. The boys over seventeen are allowed to go out by themselves, but have to carry home, or to their parents' substitute, a pass indicating the hour when they left school. This pass has to be filled out by the parents, so that the schoolmaster may know when the boys got home in the morning and when they left it at night.

The boys who do not go to their parents but stay at the school, get a longer playtime, are allowed to read novels or other books all day long, and are taken for a walk as on Thurs-

day. A boy who gets bad marks not only cannot go out on special holiday Sundays, but often stays at the school, as a punishment, on general holiday Sundays. Though the ways of punishing boys are not varied, they are very often resorted to.

First of all there is no corporal punishment, no caning, no thrashing. Such punishment is strictly forbidden throughout all France. Indeed on this matter the general feelings of England and France are very different. I do not mean to disparage the one or the other. I will only quote what an English boy once said, hearing that a French boy would not stand being caned: "Those French boys, what a set of cowards! They can't stand a good caning." On the other hand, a French boy would say: "Those English boys, how debased they must be to submit to a caning so easily!" The way in which the two nations look at this mode of punishment is very different; but in the main the sense of honor is equally deep seated in both of them.

However, there are other methods of punishment that are as vexatious and perhaps more so than those of a physical sort. The latter, indeed, are quickly over, but a boy who is kept indoors on a Sunday has all the day long to repent the mischief for which he is detained.

Every evening marks are given by an usher to each boy for his conduct during the day, his application to his work and the way he has repeated his lessons being taken into account. These marks run from 0 to 6; 0, 1, and 2 call for punishment; 4, 5, 6 entitle the boys to good marks or credits. At the end of the week, according to the average of their marks, the boys get punished or are given cards attesting their good work and conduct, which cards may later on compensate for bad marks. The professors, too, have to give similar reports of the boys' work, which reports serve as a basis in awarding rewards and punishments of the kind noted above. A lesson badly recited both to the usher and to the professor must be learned by the boys, during the playtime, till they can recite it in a satisfactory way.

The only compulsory bodily exercises are military drill in summer, and the practice of gymnastics all through the year; but as the latter do not take place more than twice a week for half an hour, during which twenty boys have to go in turn through the same performances, the exercise imposed on every boy scarcely amounts to more than ten or twelve gymnastic movements a week. Moreover, as the gymnastics and drill are gone through during playtime, the boys as a rule look upon them as studies, and do not take to them as heartily as they should. There is no cricket, no tennis, no football, no compulsory game of any kind; shut up in their courtyards the small boys enjoy running games, or leap-frog, or the various games which are played with the penny skin-balls, marbles, or tops. Of course when they grow older they cannot find much pleasure in these rather childish games, and then they take melancholy walks around the yards, or even sit down during all the time allowed them for playing. So they have not much exercise after all.

In fact the rules of the school chiefly tend to intellectual development, and I hasten to say that this is well attended to. The professors are all learned men who have taken their degrees. They do not live in the school buildings. They have their private abodes in town, and only come to the school to give their lectures. When they have given them the boys are taken back to their schoolrooms by the ushers; then the professors go home to their own families, and do not trouble themselves any more about their pupils, except when they correct their essays and other exercises and prepare the lectures, which they all do with great conscientiousness. The corps of professors is a select one and well thought of in France. Everyone knows they are serious, conscientious men, who have had to work hard to get through their examinations. Public esteem and consideration makes up for their comparative small stipends. The only drawback to their intercourse with the boys is that it is not more frequent and intimate. Every year the professor has new pupils; by the time he really begins to know them, they leave him. On the

other hand this system has this advantage: that every professor always teaches the same things and boys of the same age, and so comes to know the best way of impressing his lessons upon them. At the head of the Professors is the *Proviseur*, an old professor himself. He does not give any lectures, but represents the school in its relations with the Ministry and the boys' parents.

So on the whole it may be said that the discipline in French schools is a compound of the military and religious habits of the country, and of the influence of the Middle Ages—a time when the mind was cultivated exclusively and the body was entirely neglected, as we see in those ancient Italian pictures in which the gowns of the saints can scarcely be said to conceal a body, the attention of the artist having been given to the face exclusively, as being the seat of intelligence and mental expression. The school rules, we have seen, entirely neglect the physical development of the boys, and besides afford them scarcely any mental diversion. No book is allowed which has not been read previously by the head master; never does a newspaper enter the gates of the school; the boys, big and little, are as much secluded from the world as if they were monks, and are alike ruled by the same strict discipline. It should be borne in mind that there are in the *Grand Collège* boys over nineteen years of age. So it is not to be wondered at that no young Frenchman has pleasant recollections of his school days.

On the contrary, the young man nineteen years old longs for the day when he will be able to leave school; and as the school has not prepared him for real life, when he does leave it he finds himself in an entirely new world, as it were. He does not know how to use the freedom which is given to him so suddenly, and too often indulges in reprehensible pleasures with an ardor and a lightness of heart which perhaps may account for the reputation for wickedness which, as a rule, is given to all Frenchmen in England.

On the other hand his intellectual education has been a very good one, and I think that average men are better educated

in France than in England. There are now so many Bachelors of Arts in France that whoever is not a B. A. cannot think of entering any liberal profession, or even of becoming a clerk in an important office. I remember an English clerk once asked me seriously if we kept Guy Fawkes' day in France. I suppose he thought that all the nations of Europe had had a gunpowder plot discovered on November 5, 1605. He was of a good family and had been brought up at Christ's Hospital. No French bank clerk educated in a Lycée would make such a remark.

Having been secluded from the world, the young Frenchman enters it desirous of knowing everything, and having gone through a good classical education he is apt to understand and to take quickly to any new, progressive idea. The young Frenchman in his secluded school life has pondered great political, social, artistic, literary questions and has formed ideas of his own on all these topics at an age when the young Englishman is still a boy, and still cares only for his games and sports. Hence the boldness of French theories and attempts in every branch of human activity. All their political ideas, their social systems—all their attempts at novelty in literature, in painting, in engineering, are nothing but the result of the work and reflections of minds overworked, refined to excess, and excited by the contact of similar minds around them. It cannot be denied that of those ideas and attempts which often seem so strange and even monstrous to the sedate English mind, many are indeed absurd and doomed to perish; but it must be owned that many, too, have been adopted by foreign countries, and perhaps many others will be accepted in the future which now are treated with mockery and contempt.

At any rate whatever may be the opinion that Englishmen hold of Frenchmen in other respects, they agree that the bulk of the people in France are more quick-witted than in any other country, and, although they may condemn the French on many points, they entertain a sympathy for them which appears in the interest they take in French affairs. Yet

Athens was crushed by Sparta, although the general sympathy is for Athens. Perhaps such will be the fate of France, or rather such would have been her fate! But fortunately her people have been roused from their physical torpor; they now seem to understand that brute force, if not all, is something at least. Gymnastic societies have sprung up all over France, and already some large private schools in Paris make it a rule to send their boys out of town once a week that they may have bodily exercise in the open air. Moreover, I understand that Parisian students intend to start a cricket club among themselves. It is to be hoped that they may succeed, for the example once given would be followed by all students and all schools in France. Then in the bringing up of French children there would be that equal balance between bodily and mental exercise which England has had the good sense to preserve, and to which she no doubt owes the earnestness and steadiness of her political and social progress.

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VII

EDUCATION IN FOREIGN PERIODICALS

Rousseau's Theory of Education

A. E. Street in "Macmillan's Magazine"

"We have, most of us, been accustomed to accept Rousseau as a man whose genius was in too real a sense the issue of a diseased condition of mind and body for anything sane or wholesome to come out of him. To parents and guardians indeed his name has long been anathema; supersensitive, heterodox, lax in morals, the enemy of society, the sport of a maudlin sentimentalism, to them his name, whatever vision it may call up, certainly does not spell education. Yet the claims of *Émile* as a work of serious ethical purpose once stood high. The book in truth bristles with defects which are so patent that the critic might almost pass them by if they were less fundamental. As a matter of fact they form the basis for the whole superstructure. One virtue, however, it assuredly has, and that is the solid one which belongs to the work of a man of clear head, of full courage, and rare power in the manipulation of language. The result is a homogeneous and comprehensive whole, in which each least significant detail has been treated with a microscopic thoroughness. So thoughtful a contribution to the science of the education of children deserves at least our respectful recognition. Starting from the very birth of his subject, Rousseau does not quit him till he is safely married to a wife, as well equipped educationally for her part as he for his; nor is he content to deal in generalities and avoid difficulties, but, on the contrary, lays down rules which leave something to be desired on the score of flexibility, and divides the matter with which education is concerned with a preciseness which argues some want of sense of the intimate way in which one subject is bound up with another. More important still, he confronts the religious question with boldness, and in The Savoyard Vicar's profession of faith expounds the emotional Deism which was the natural issue of his fervid temperament.

"It is difficult to forget that the man who begins his book

with an appeal to mothers as sensible as it was well timed, and displays a positively minute thoughtfulness for helpless infant humanity, had in his own person flouted the maxims which he was presently to lay down. The reader of the *Confessions*, however, will remember how hardly his denial of the obligations of fatherhood weighed on his conscience in later years. Nor does it do to forget that the man was made up of contradictions, that the aspirations of one day were forgotten the next, the vows revoked, the convictions undermined, and all in perfect sincerity. Nature and circumstance combined to make him what he was, one of the most notable illustrations of weakness in strength that the world has seen, enemy to no one but himself, suspicious of every friend, but a firm believer in the goodness of human nature at large.

"The fashionable mothers whom Rousseau denounces and on whom he cries may very possibly be matched to-day; but for the vast mass of contemporary motherhood there is nothing to detain us in the recommendations on purely physical matters with which the earlier pages are filled. Man in his natural state, with a simplicity of tastes which makes him relatively strong, lord of himself and self-sufficing, innocent and kindly —an abstraction, in a word, in the formation of which the evidence of savage life goes for nothing—is wholly virtuous. If, as we know him, he has his faults, it results from nothing but mistaken education. This granted, it follows that the natural disposition should be allowed time to crystallize before active education is begun. On these premises, the latter of which might be admissible if the major were not so glaringly false, Rousseau bases his system. Admitting, as he does, every possible difference between one man and another except in this one element of goodness, he lays it down as essential that the first ten or twelve years of a boy's life should be devoted to the encouragement of the body, while the mind is allowed almost to lie fallow. A strong bent will turn everything to account. But Rousseau will tell us that, in the great majority of instances, to attempt education before the character has made itself clear is to court disaster. Persistence may mean success in preventing the true disposition of the pupil from ever showing itself, but cannot make it become other than it is, a proposition not easy to reconcile with the aforesaid theory of degradation.

"The corollary of this large and unsupported assumption is

the denial of morality or reason to childhood. Reason, by some strange perversity, is assumed not to grow with the years, but to spring up in a moment half mature, as if it were a sudden gift from Heaven.

"Rousseau, who tells us that he would rather be a man of paradox than one of prejudice, hastens to assume the former character, without making it quite clear that he avoids the latter, by declaring, as he does over and over again in one form or another, that the greatest, the most vital rule of education, is not to gain time, but to know how to lose it; and he will have it that, if time is lost as it ought to be, the child whose stock in trade at twelve consists of a well-nourished and active body, and a mind the tablets of which are still almost unsullied, will so make use of these seemingly modest acquirements as to be level with his contemporaries in three years.

"It is plain that the child becomes at once far more difficult to approach if we can appeal neither to the germ of conscience nor to that of reason. Rousseau, however, who was imbued with a notion of the stern law of necessity which Greek literature made familiar to us, and Victor Hugo has illuminated with the light of romance, finds in it a controlling power which serves his turn. The dim consciousness of impotence must necessarily be common to all children at an early age, and their reliance on others opens a ready means of exercising control. When the law is to be enforced there must be no question at all as to its finality. The 'No' of the parent is to be like a wall of brass against which the tiny hands may batter in vain, impassive, immovable, and inexorable. This simple substitution of force of circumstances for exercise of authority secures a course of conduct in the child which is almost purely mechanical, and, where morality is denied, it is a strictly logical proceeding. The result of course is that, as there is no authority, there is no obedience; and where there is no obedience there can be no rewards or punishments, as such. If, for instance, we take the case of a child who has made itself troublesome by breaking windows, as he acts purely from the destructive impulse which is common to the young, we accept it in silence. If the thing occurs again we are to say dryly (a device which is either meaningless to a child or distinctly harmful, but a very favorite one with Rousseau), 'The windows are my property,' and proceed to shut him up in a dark room. He will probably appeal to a servant to let him out; he is

struggling against circumstances and not against authority, be it remembered, and his action is quite justifiable; but his tutor has, of course, been beforehand, and the well-drilled servant refuses on the ground that he too has got his glass to preserve. Finally, on a hint which the child catches, he proposes to give up glass breaking in exchange for liberty, a thing which he is only too glad to do, and is restored to freedom. This brief illustration is enough in itself to expose the utterly unnatural character of the system on which the prophet of nature works, but there are one or two points which call for particular attention.

"It must have occurred to us at once that the law of necessity by itself was a far from adequate equipment for the parent or tutor. An active, moving principle is every bit as essential as that of control, but it was left quite unprovided for so long as the sense of powerlessness in the child gave the only hold on him. We have now learnt that this is to be supplemented by a sense of expediency pure and simple. It will be noticed that the proposition just mentioned comes, or so the child believes, from himself and not from his tutor, and it is vital, if Rousseau was right in his estimate of a child's character, that it should do so. A promise extracted from a child, as we now learn, means absolutely nothing to him; give him a cake and he will undertake to jump out of the window directly he has eaten it; but when the cake is finished, so is the whole transaction so far as he is concerned. If, however, the undertaking is his own, it is so because he has seen clearly that he will be no loser. Here, then, is direct encouragement of a most ignoble and debasing impulse. 'Speak to him of obedience,' says Rousseau, 'and he will not understand you; tell him to do something, he will not hear you; but say, "If you will gratify me in such and such a way, I will do the same by you when I have an opportunity," and instantly he will do his best to carry out your wishes.' There is another noteworthy feature in this episode, and that is the evident prearrangement of the scenes through which he passes. Ask any man or woman what qualities they consider most essential in dealing with a child, and it will be surprising if they do not name straightforwardness among the first. Rousseau will have none of that; if his goal is truth he marches to it along the path of deception, and seeks nature amid the trickeries of the stage. Not only is every servant in the house trained to act a part, but the

gardener is taught to fly into an assumed passion, so that *Émile*, who has been using his spade not wisely but too well, may learn not to interfere with the rights of property. To know *Emile* is indeed to submit yourself bound hand and foot to the dramatic instincts of the tutor, who prearranges everything, even to the meeting of his pupil with the woman who has been marked out for his wife. Indeed one almost forgets that it is a philosopher who is expounding his system, and begins to laugh with the writer when he describes the astonished disappointment of the tutor on discovering a scene between a comrade and his pupil, which he had taken to be a regular set piece after his own heart, to be a mere unrehearsed effect, after all.

"The virtues of his method are still to be found. Morality we have seen denied; we have been told that the child who gives alms does so because he looks for a handsome compensation; that to treat youth as reasonable is to make it disputatious; to put a child on his honor is to teach him to lie, and to exert authority to foster mutiny; but all this and more than this is explicable when we remember the nature of the society in which Rousseau moved in Paris. He, of course, argued wrongly from the results which were before him; but an unreasonable, untrustworthy, selfish, and mutinous habit is so easily engendered in childhood that a too hasty denial of qualities, which a clearer insight would have shown to be there all the time struggling vainly to the light, is at least an intelligible mistake.

"If we once realize that for Rousseau the evidence for his conclusions was convincing, we shall see that he had no alternative but to enlist some form of the law of necessity in his service, and the proceeding is all the more natural when we remember what education meant for him. The end which he proposed was not likely to be a conventional one. The ideas which went to feed the French Revolution, the sentiments which Robespierre took for his own, break out on every page. The dignity of labor, the equality of man, the merits of good citizenship are his watchwords; Nature is his goddess. He will train up no mere gentleman, as Locke did; he has not that honor; but a man of simple habits, of pure desires, and ready hands, a man sociable and friendly, who reads in no book but that of nature, who honors age more than office, and exalts busy toilers above mere intellectual eminence, who listens to the voice of wisdom and not to that of opinion, who

loves the beautiful and pursues the right. Experience alone, says Rousseau, will fit a man for the battle of life, and the child cannot too soon make acquaintance with the stern logic of facts. If the disillusionment comes late in life it will be all the rougher, and the subject will be less well qualified to endure it. Briefly, the child as soon as it realizes anything will find itself a member of a republic in little, not the crowned king of the household. Badly put, a system of passive resistance to impotent tears seems a harsh one, but if refusal is to be absolute, so is assent to be unconditional. Rousseau will tell us that if the fancies of a child are once given way to he will become a tyrant. Nature has made him feeble because his tendencies are all destructive; but if he is able to turn all about him into his agents he will wreak his mad will like a Caligula of the nursery. I have seen a child, he says, who asked to have the house upset, who would play Mahomet to the mountain, and set down the impotence of his slaves as sheer rebellion. The child, then, must, when the occasion comes, submit to the inexorable yoke of facts; but, generally speaking, he will be accorded a measure of liberty which, at first sight, is only bounded when it trenches on the liberty of others. More liberty, less empire; that is, in sum, the key-note. The earliest tears of a child are prayers; for good or bad, they are his only means of communications, and to ignore them or treat them as a crime is to evoke a lasting sense of injustice. All this may seem too trivial to occupy a philosopher; but if he did not esteem it beneath his notice, it is worth ours too, because it serves to correct the impression of severity which a less particular scrutiny undoubtedly creates. That is far enough from Rousseau's mind. 'Why,' he rather asks of parents at large, 'why destroy the happiness of those little innocents during the brief years which slip away so fast?' All this time the hardening process is going on. Rousseau certainly makes a great mistake in wishing to accustom his young charge to the sight and touch of things which are absolutely revolting in themselves, whether it is done by degrees or not, for acquaintance with what is hideous and startling must either unduly blunt the sensibilities or shatter the nerves, and when to this is added an ordered irregularity in meals, bedtime, and length of sleep, so that nothing may be the result of habit and everything of actual need, it is plain that this will indeed be a case of the survival of the fittest.

"Scattered broadcast over these pages, like gold among the sand, are many of those acute observations, those notes of universal application, those felicitous illustrations which give this book a permanent value for those who will set themselves to read it. What more happy in a small way than the comparison of the child who is fondly supposed to be precocious to the prophet of the almanac? It would be odd if one prophecy did not come true out of hundreds, and it is equally unlikely that a child should go on talking nonsense indefinitely without happening upon a single jewel of speech. Again, how obvious when once said, and yet how needful the warning, that what words mean to us they may not, and probably do not, mean to the child; that with him nothing must be left to be understood, or you will find that the world is supposed to be made of paper because the globe is so. But all this must be sought in the book itself. There is, however, one scene which ought to be reproduced, because it exposes so happily the futility of supposing that a child can rise sufficiently from the concrete to the abstract to take an intelligent part in the discussions of his elders. It appears that at a certain dinner, whereat our tutor was present, the question arose as to whether Alexander was to be rather blamed for his rashness or applauded for his courage in drinking the medicine which he had every reason to suppose had been prepared for his destruction. The debate waxed high; the tutor, who tells the story, modestly nursed his own superiority, and only informs his readers that, to a man of understanding, Alexander's merit of course lay in the practical assertion of his belief in human goodness; the *petit bonhomme* was not so reticent, and gave his vote for courage rather than rashness amid acclamations. Subsequently the tutor, who had his suspicions, took the boy for a walk in the park; all his chatter was still of the Macedonian's unprecedented pluck, but wherein did he believe it to consist? Merely in this: that he had drunk a nasty dose at one breath and without changing countenance.

"With all his devotion to bodily culture Rousseau did not of course look forward to having a merely well-developed animal on his hands after twelve years' training. He puts reason aside altogether for the time, but he devotes himself untiringly to perfecting the senses in the performance of their various functions, without condemning his pupil to the sedentary life which he declares with justice to be naturally abhorrent to

youth. The sharpening of the senses being the end, the more particular branches of learning are regarded simply as means and quite devoid of any intrinsic value. Thus we find that, if *Émile* is to be taught drawing, it is purely and simply for the sake of the sympathy between hand and eye which it fosters. With the same object the child shall be encouraged to disport himself at tennis and billiards, and shall intensify the sense of touch by playing various musical instruments, and by accustoming himself to doing things in the dark. Further, he shall learn by experience the elementary principles of mechanics and hydrostatics, and, as his reason grows, shall work out for himself (for the tutor is never to do more than start a train of thought) the motion of the earth; he shall learn to calculate weights, numbers, and distance, the relation which sight bears to hearing and that of smell to taste, in which connection Rousseau, who is now bent on reality, takes occasion to declaim against the common custom of smothering a powder in sugar, because it makes null and void the wise dispensation of nature in setting the nose as the Cerberus of the palate. The Central African who answered his European guest's objection to dine off stinking fish by saying that one does not eat the smell, dealt in subtleties which do not make our philosopher's appeal less logical, however strained its application. Such an education as this has nothing in common with a town life. Man is no book for child to read in, whether he be the man in the street or the man of history, of the workings of whose mind the historian says so little, of his mere physical actions so much. There is no book, indeed, which is not useless at this stage, for they offer, as yet, mere words without ideas. Memory's day too will come, but not till the light of reason is already above the horizon, for her real province is to supply the raw material for reason to work upon, the receipts, as they have been called, in the association of which the concept has its being. And if the books are valueless, so too is the multiplication of languages. Cornelius O'Dowd once said that no great linguist was ever a great man, because the art consists not in the mere adoption of words, but of ideas, in a change of mental attitude, and argues a want of backbone and conviction in its possessor; so Rousseau will tell us that to give a child a second language is merely to double his stock of synonyms, without adding to his stock of ideas.

"The boy is now supposed to have reached his twelfth year,

and we have already seen the beginnings of the reign of reason. Purely Utopian as is Rousseau's scheme as a whole (and he really owns to so much himself), there is something fascinating in its unshackled originality, for we may call it original, though Plato has been laid under contribution; and in the daring thoroughness which will allow nothing to be food for memory which has not been first understood, which makes more bearable the obvious artificiality and insincerity of a method in which the child is entrapped into lessons when he least expects it, in which the semblance of liberty conceals a real subjection, in which stones are forever supplying sermons, and nothing is too humble to point a moral. No stronger argument against it, however, could be found than the picture of the *enfant terrible* to whom Rousseau proudly points in vindication of his theories.

"So far we have been merely putting in the foundation. The actual superstructure is now to be built up, and Rousseau begins by casting about for something which shall express vividly the sort of 'handiness' which he believes to be the important feature in the education of rich and poor alike. He finds what he wants in his choice of a manual of education which is, not Aristotle, nor Buffon, but *Robinson Crusoe*. If the meaning had been obscure before, it would have been patent now. Man must be a good citizen, but he must be a little republic in himself, independent and self-sufficient as if he were born to live under the ideal conditions of the state of nature. Whatever his station he must learn a trade, for there is a solid resource in that, and the more nearly it is allied to nature the more honorable it will be. This clearly points to agriculture; but *Émile*, who was already familiar with country life, becomes the apprentice of a joiner, not so much for the sake of learning joinery as such, as to raise himself to the position of a joiner. The truly republican flavor with which the whole system of education is tinged is shown not less in the work that is done than in the conditions under which it is done. Each man or boy is the citizen above everything, the unit in a large society of equals, and his work is to be regarded, not as an individual production, but as a contribution, bad or good, and by whom made no matter, to the common fund of labor. Rousseau has discountenanced anything like emulation from the first; he denies this stimulus altogether now, and when *Émile* is preparing to take to himself the praises of a piece of

work which is his own, the tutor says coldly, 'The work is yours, or someone else's; it is none the less well done.'

"Nothing could point more clearly the paramount nature of the claims of society; and at the very end of all when *Émile*, now fully equipped for life, decides to cast in his lot definitely with his fellow-men, and his decision is acclaimed, still there runs a thread of antagonism to this dependence on man throughout the book, as if its writer were putting the pros and cons to himself no less than to his imaginary pupil. Elsewhere he calls on man, if he would be happy, to restrict his intercourse, and to put his dependence wholly on things if he would be free. Here speaks the man whom the most earnest remonstrances of his friends could not keep from his well-loved solitudes, but the obvious bent of his own personal predilections does little to disturb the tenor of his teaching, and we shall see, now that the study of mankind is to begin, how sedulously he nourishes a feeling of love and pity for humanity.

"Human nature, unfortunately, as Rousseau knew it, would, as he felt, have been more likely to shock a boy whose life has been spent in a state of pastoral innocence than to move his sympathy. As yet he has not learnt the meaning of the latter word; but as Ulysses felt pity when he looked on Ajax distraught, so may a hint of the mutability of human things move him to some semblance of compassion. Extend your self-love to others, says Rousseau, and it will become a virtue: a sentiment which may be Aristotelian, but it is not convincing.

"If, however, innocence is to look on worldliness without contempt, he must first have taken to himself the doctrine, which his tutor would have been quite sincere in teaching him, that man is naturally all that is good though society may be all that is bad, and that while all collectively are contemptible, each individually calls for a profound pity. Let him turn now to history, and particularly let him study in the incomparable Plutarch the behavior of the great in the little things of life, for there, more than anywhere else, the picture of the man of the market place finds its balance and complement in the intimate study of the man of the domestic hearth.

"The question of religious instruction is too large to enter upon here, and it must suffice to say, speaking broadly, that Rousseau would envelop the idea of God in a profound mystery, trusting, with some show of reason, to impress the pupil's

imagination more completely in that way than by any specific teaching. This, at any rate, must suffice till, in the natural course of its expansion, the mind becomes persistently engrossed with such lofty matters. His own religion, while he preaches in other things the sternest refusal to take anything for granted, is strictly emotional; he denies all revelation, as generally accepted, on *a priori* grounds, but practically substitutes, for his own personal support, a revelation which has no better credentials than the cravings of his nature. 'What!' he says, 'if there were but one man in the whole world, to whose ears the word of God, as revealed, had never come, would that not be enough to discredit it?' To which we may reply that his reliance on the beauty of the world, as the sign of a beneficent Maker, would be just as completely answered if there was a single human being in existence who knew no other world than the Black Country.

"But if religion is to be postponed, some sheet-anchor must be found to hold the frail bark from drifting on to a lee shore, a point which naturally did not escape a too susceptible Rousseau, though, as he says with much justice, the moral obliquities of a young man are much more generally a concession to opinion than the result of any personal predisposition. His natural bent is rather toward friendship and hero-worship; and if, in *Émile's* case, this tendency is not well defined, he has, at least, an absolute disregard for opinion and a large degree of self-esteem. Rousseau, however, thinks the danger a real one, and he proposes to meet it doubly, by tiring the body and preoccupying the imagination. The first object is to be attained by a persistent devotion to the pleasures of the chase, and the second by chaining the roving fancies to an ideal, which is endued with a name for the sake of giving it reality. Thus the second expedient proves a little less mechanical than the first, and we are still face to face with the fault which has been our bane from the very beginning. The meeting of *Émile* and the real *Sophie* is the climax of deception; it resulted from an elaborately arranged accident in which *Sophie's* parents took part, and in point of fact the two young people were no more free agents than if they had been driven to the altar at the point of the sword.

"With the two years' probation which tutor and pupil spent in travel we need not particularly concern ourselves. Their study was rather the societies which peopled the countries

through which they passed than the countries themselves. But if this was the purpose which the journey was ostensibly to fulfill, there was another reason at the bottom, and that a purely moral one. Mere physical pain has been met and vanquished; death is regarded with something of the indifference of the savage; but the moral victory over the passions has still to be won, for, so far, they have been diverted rather than faced. Here Rousseau rises, almost for the first time in practice, however often in words, to a higher level and a purer atmosphere than we have hitherto been breathing in his company. But this is the last touch; and in a moment we find him presenting to us as his handiwork a man in whose armor of perfection there is no discoverable flaw, who is whole in mind and body, full of sense, of reason, of humanity, pursuing the good and the beautiful, master of his passions, no slave to public opinion, but amenable to the dictates of wisdom and obedient to the voice of friendship, possessing every useful talent, and many agreeable ones. So the catalogue goes on; it is not new to us as an aspiration, but it is now presented to us for the first time as an actuality. Are we to take the artist at his own valuation, or may we not ask whether our Pygmalion is justified in believing that his marble-cold creation is now informed by the breath of every virtue? Confining ourselves to the moral aspect of the matter, is it possible, we ask in amazement, that a human being whose mainspring has for so long been pure selfishness, could ever be to his fellow-men what Rousseau would have us believe? Is love of self a quality which needs but extension to be love of mankind, or is it not rather something which will brook no rival, but grows with the years, till it reigns undisputed on the throne of the affections? Is he a truly moral man who is moral by habit rather than by conviction, who has known nothing of self-restraint but impotence, who has curbed his anger because he believed it to be a physical seizure, who has been truthful because a lie could never profit him, who has befriended his associates that he might be befriended in his turn, who has lived for the moment and left the future to itself, whose compassion is rooted in self-regard, who has had the spirit of opposition trampled down in him, and has not been allowed to quell it? All these are merely the virtues of passivity, yet it is Rousseau himself who asks how we can be virtuous without a combat, or strong if we have not subdued weak nature to our will. Strange words

those for one who does his best to change a moral being into a machine. No! the choice must be made once for all; morality stands on one side, habit on the other, but they cannot dwell under the same roof-tree. It is easy enough to assume that all means to a good end must be good, that the end will abide by the pupil, while the means sink into oblivion, but habits cannot so easily be taken up and discarded, points of view shifted, and old lessons forgot, as Rousseau implies. He deludes himself if he believes that he has reached his goal, for the man whom he vaunts so confidently with his many-storied Tower of Virtues is like a house that is built on the sands. Let the winds once blow and the rain beat, and its foundations will crumble from under it."

VIII

DISCUSSIONS

ADMISSION TO COLLEGE BY CERTIFICATE

University of Nebraska

The results of my observation and experience, expressed without much regard to order, are as follows:

1—In the West, at least, very few students present themselves for examination at Commencement. They cannot afford two trips to the university.

2—Therefore, in the West, at least, most students come to the September examinations rusty, by three months' vacation, and conscious of this to a point of loss of assurance and of great embarrassment.

3—In the West, at least, it is still quite impossible to hold all entrance examinations on a given day. Students cannot always afford to drop work in the middle of the month, or come up early in the fall.

4—Everywhere there is a tendency to make *some* entrance examinations rather light, and to trust much to personal impressions of a student and of his work.

5—An examination conducted by a stranger to the student and his habit of thought and to the methods of his instruction—and conducted at a time of peculiar embarrassment to the person examined—cannot, in the nature of things, secure just or adequate results.

6—Such an examination tells almost nothing of *power*—which is far more important than mere information.

7—Admission by certificate brings all parts of the school system together in a helpful and stimulating way.

8—It is a recognition which ought to be rendered by the university to workers in other parts of the State system.

9—Students admitted by certificate have secured quite as good average standing as those coming in by examination. If there is any difference, it is in favor of the former.

10—Everything connected with regular school work and usual examinations favors a just and accurate estimate of the

success, power, and knowledge of a student; while nearly every condition of the university entrance examinations is against such an estimate.

11—The standard of an institution is not determined so much by its criticism of work done elsewhere (examinations) as by its own work.

12—The doors of any institution may safely swing inward quite easily; but it ought to take hard work to swing them outward.

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Williams College

In 1876 the President of Williams College obtained from the Trustees authority "to make such provision relating to the examinations for admission to college as he deemed for the interest of the college and the convenience of the applicant." Before this date other New England colleges were reported to have introduced the method of admission by certificate, and the vote just cited was now interpreted as warranting its introduction here. The catalogue for 1876–77 therefore announced that "students who had completed the full course of study equivalent to that required for admission to this college, might, by special arrangement, be admitted on certificate of their instructors."

It may properly be said at this point that there was no demand in the Faculty for the new method. Probably a majority did not favor its introduction, and it was consequently at a disadvantage from the outset in respect to the attitude of a considerable number of the Faculty toward it. This is an important element in the history of the certificate method at Williams, as it necessarily follows that the general acquiescence with which the working of the system is now regarded and the entire lack of any active hostility to it in the present Faculty, have come in spite of an initial presumption against it, and are due to the absence of the evil results which were apprehended from it.

The announcement of the catalogue for 1876–77 was received with satisfaction, if not by the Faculty, certainly by a large number of the teachers and by a great majority of the students preparing for college. In 1877, the first year in

which the new method was applied, two-thirds of the Freshman class entered by certificate. Five years later the proportion was three-fourths, while for several years past it has been stationary at about eighty per cent.

At first the method was not adequately systematized or restricted, and some poor material reached the college in consequence, but the Faculty began at once to introduce various checks and safeguards. From year to year changes were made in the regulations which helped to prevent the entrance of poorly fitted men, and we now feel a good deal of confidence that we get no larger proportion of imperfectly prepared students by this method than we should get by examination. Some such men do secure admission even by the examination system at every college.

In brief, our usage is this: The right to send students by certificate is not granted to any private tutor. It is not thrust upon any school, but is given to those schools only which apply for it. It is given by vote of the Faculty after the credentials of the school have been examined and approved by the proper officers of the Faculty. These credentials must show that the school has a suitable course of study preparatory to college, and that it devotes an adequate length of time to the several subjects of the course. The school must have had successful experience in preparing boys for college, or it must offer such evidence of its standing, in addition to the credentials above mentioned, as will create a presumption in its favor such as to warrant giving it a trial. The certificate must show the length of time devoted to the principal subjects, and if the time is less than the permitted minimum the student is required to be examined in that subject though the rest of the certificate is accepted. This regulation is enforced in several cases every year.

Certificates are accepted only for the preparatory requirements and never for any part of the college course.

As regards the dishonest use of the certificate right by schools it may be said that there has probably been no case in our experience in which the teacher has designedly taken advantage of the system to abuse it. There has occasionally been a case which created some misgivings as to the teacher's honesty, but even then there has been no clear evidence that he was guilty of anything worse than lack of judgment. In general it may be safely assumed that the masters of the

preparatory schools are honorable men, and that they will not take advantage of their certificate right in order to foist upon the college students clearly unfit for admission. They are also intelligent men and know that such a procedure would be impolitic as well as dishonorable, since it would necessarily discredit them and their schools both with the college officers and with their own patrons.

Setting aside, then, intentional dishonesty in issuing certificates as occurring too rarely to require any consideration, it must be frankly conceded that masters of schools are sometimes too lenient in giving boys the benefit of the doubt and so issuing certificates in their behalf. The teacher hopes that the more stimulating influence of college competition and the absence of home distractions will tend to develop the student's ambition and capacity, and thus enable him to reach a higher standard in college than he has reached in school. Sometimes the teacher's leniency is justified by the result. More often it is not justified, and the sifting and eliminating process which goes on here, and presumably elsewhere, during the early part of the college course, is the necessary effort to throw out material which has entered by certificate, but which proves unfit for retention, just as in some other colleges the same process results in eliminating similar material which has slipped through the examination gates in spite of the watchfulness of the gate-keepers.

It is the policy of Williams College to give each student every reasonable opportunity to justify his retention in college. He is dealt with patiently and considerately, but when it has been demonstrated that he is not fitted for a successful college career the experiment is ended without delay. This policy must show the teacher upon whose certificate the dismissed student was received, the necessity for greater care in issuing certificates. It is more of a disgrace to be dropped from college than to be kept at school a year longer, and at least part of the responsibility for the greater disgrace must rest on the teacher through whose bad judgment it was brought about.

If, however, the school continues to send crude material and does not respond to the suggestions of more thorough work and of greater care in issuing certificates, the certificate right may be withdrawn. In extreme cases it would be withdrawn as it has been in the past. The desired end can, however, generally be reached in other ways, and hence the revocation

of the right is rare. It is held in reserve to be exercised when milder measures fail.

It should be remembered in defense of the certificate system that it does not abrogate examinations for admission. It simply shifts the place from the college to the school. It is upon the results of examinations and of other school processes that certificates are based. And it hardly needs argument to show that an intelligent and discriminating teacher, after several years of observation and scrutiny of a class in examination and recitation, has wider and better data on which to base a judgment of a boy's fitness for college than can be secured from the necessarily hurried entrance examinations at the college itself.

This statement has obviously taken, in the main, the form of defense of the certificate system rather than of active advocacy of it. The aim is to show that the experience of Williams College does not bear out the frequent contention that the disadvantages of this system more than counterbalance its advantages, and that the tendency of it is necessarily to lower the standard of scholarship in college in comparison with admission by examination.

The advantages of the system are so obvious as to require no cataloguing. To it is to be credited an immense saving of nervous strain to the candidates for admission, and of wearisome and thankless drudgery to the examiners.

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IX

REVIEWS

Lernen und Forschen. Rede beim Antritt des Rectorats an Friedrich-Wilhelms-Universität zu Berlin, gehalten am 15 October, 1892, von RUDOLPH VIRCHOW. Berlin: Hirschwald, 1892, S. 27. Price 1 m.

The Aula of Berlin's great university has been dignified by many noble orations, and this one by the great scientist who is the Rector for the present year is as earnest in tone, as elevated in spirit, and as eloquent in expression as any that have preceded it. Two lines of thought, one main and one subordinate, run through the address. The former is that the university exists not merely to teach what is known, but to explore new fields and to cultivate a taste for such exploration and a proficiency in it in the student body. The latter is that *Lernfreiheit*, the liberty of the student to do what he chooses and as much of it as he likes, has been allowed to go too far, and now seriously threatens the good name of the university.

On the last named point more is implied than expressed; but the reader who knows what has been going on at some of the German universities during the past ten years, sees clearly enough that Professor Virchow means that university legislation must correct the evils of *Lernfreiheit* if warnings and exhortations such as his are not promptly heeded. He traces the various stages of the development through which student privileges have come since the Middle Ages, and shows that "der Student ist nun in vollem Sinne dem bürgerlichen Recht unterstellt; er ist ein Bürger." His business is therefore to devote himself to study, and not to waste the early semesters in mere social enjoyment and in the ostentatious use of traditional privileges and exemptions. "'Akademische Freiheit,'" says Professor Virchow, "bedeutet nicht 'Freiheit im Nichtsthun,' nicht 'Freiheit im Vergnügen oder in der Befriedigung der Leidenschaften,' sondern '*Lern*freiheit.'"

The author's reason for dwelling upon this point with such emphasis is not, however, a mere disciplinary or administrative one. He goes deeper, and points out that if *Lernfreiheit*

is abused the student can never become an investigator; at most he will be, during the later semesters, a learner cramming facts for examination purposes. The ideal university career, on the other hand, is one in which the earlier portion is spent in acquiring a thorough grounding in some department of knowledge, in order that the power of independent research may be given an opportunity for training later.

The latter portion of the address is devoted to an analysis of the power to investigate, as it shows itself in university students. Professor Virchow claims, as Americans do, that the school curriculum is not so organized and administered as to develop fully the child's curiosity, which lies at the base of all scientific research. Something is done, he admits, in this direction, but not enough. Mathematics, philosophy, and the natural sciences, with their rich content and their well-developed and amply tested methods, form a "golden triad," on which our Western culture rests, and from which the highest educational results may yet be obtained. Through them the gymnasium and the university must appeal to the inborn curiosity of the young, and on them must the university chiefly depend for the stimulus and direction that is to make it and keep it not merely "eine Anstalt zum Lernen," but also "eine Anstalt zum Forschen."

N. M. B.

Psychology Applied to the Art of Teaching—By JOSEPH BALDWIN, A. M., LL. D., Professor of Pedagogy, University of Texas. New York: D. Appleton & Co., 1892, pp. xiv, 381. Price $1.50.

Mr. Sully says that[1] "the real business of the teacher of pedagogy is to take principles from the psychologist, and to clothe them with concrete and practical illustrations"; but the reader will not find this ideal carried out in Dr. Baldwin's book —one of the most recent volumes in the International Education series, edited by Dr. Harris. It contains but few attempts to clothe psychological principles with concrete and practical illustrations. It is an effort to derive pedagogical aphorisms from an old psychology that is loaded down with metaphysical speculation. These aphorisms are generally very good as far as they go; but, in the absence of concrete illustrations, there is the danger that the young student will memorize them and imagine he has acquired all the psychological and pedagogical knowledge necessary to fit him for a teacher's work.

[1] EDUCATIONAL REVIEW, IV: 321.

In the article already quoted Mr. Sully says: "Let us take the well-known laws of memory, such as the effects of interest, repetition, and association. These are indubitably laws of the very widest operation. They happen, moreover, to be the formulation of truths which have become a part of the common knowledge of educated people, and hence are apt to strike the student as commonplace. Yet I will make bold to say that almost any school you chanced to enter would supply you with examples of the violation of these simple self-evident principles." Immediately on reading this I turned to Dr. Baldwin's volume in the hope of finding explicit directions as to how these "self-evident principles" are to be applied in teaching. Instead, I found such rules as these: "Lead your pupils to study science," "Lead your pupils to study history and literature," "Reading, language-lessons, music, manners, and morals must be so taught as to educate memory as well as the other capabilities," "Doing educates memory." Admonitions of this kind are practically useless; but such are Dr. Baldwin's applications of psychology to the art of teaching. Moreover, the book appears to have been written in almost complete ignorance of the latest results of biological research; it tacitly assumes that all children develop alike, and furnishes no guidance for the training of individuals who vary from the normal, or rather, the ideal type; while of the pathology of mind it knows nothing.

There is one point of view, however, from which the book may be pronounced useful—as a guide or an aid to introspection. The importance of introspection is too often depreciated by the physiological psychologists, and Dr. Harris does well to call attention in his preface to the danger of neglecting this most important method in psychological investigation. "We apperceive," he says, "to use the new technical word for this act of recognition and interpretation of what is perceived by what is known before—we apperceive plants and animals by referring their actions and manifestations to inward selves analogous to our own." More than this it is not necessary to say in order to show the utility to the teacher of cultivating the habit of mental introspection. For this purpose the young teacher needs a map of the mind, just as a traveler requires a map of an unknown country. Dr. Baldwin's book serves this purpose fairly well.

W. H. M.

A History of Modern Philosophy (From the Renaissance to the Present)—By B. C. BURT, A. M., some time Docent in the History of Philosophy at Clark University. In two volumes. Chicago: A. C. McClurg & Co., 1892, pp. xii, 368; viii, 321. Price $4.00.

One naturally opens a work in English on the history of philosophy, particularly one on the history of modern philosophy, with interest. Morris' translation of Ueberweg is fit for reference only, and Erdmann's three large volumes are in the same category. The student who needs a manual or outline with which to follow his teacher's lectures, can use Zeller's *Outlines* so long as the ancient philosophy alone is under discussion. But from the closing of the schools by Justinian on, there is nothing to take its place. It is owing to the fact that this want is widely felt that American publishing houses are now bringing out translations of the excellent, though very different, books by Windelband and Falckenberg. Why no one has translated Weber's admirable *Histoire*, which gives a capital survey of the whole history of philosophy in one volume of moderate size, is hard to understand.

The fact that Mr. Burt's book is in two volumes would, in any case, be a drawback to its general use; but it has more grievous faults than this. It lacks any clearly defined controlling principle in its arrangement, it lacks proportion, and it is not well executed. Probably anyone well versed in the history of modern philosophy will admit that Kant is its central figure; that the development of the doctrines of Hume from those of Locke and the doctrines of Leibniz from those of Descartes must be traced and their opposition shown before Kant can be understood and interpreted; that modern German philosophy is best expounded from the standpoint of its relation to Kant; and that English associationism and the philosophy of evolution are vitally connected with Hume. In such a framework as this the various minor movements take their natural places, and the whole of the grand drama is visible, in outline at least, to the student. But if Kant is more important than Comte and Hume than Hobbes, the reader will not easily learn the fact from Mr. Burt. A few more pages, perhaps, are devoted to the one than to the other, but that is all. Even the type used to mark the grand and the minor divisions of the book is the same.

Not only is there no clear-cut and easily understood arrangement, but there is no proper proportion in the treatment of

the persons whose names and works are mentioned. Indeed some of these persons find themselves in a summary history of philosophy for the first time.

The writer's style, also, is neither attractive nor consistent. Its unevenness, indeed, is alluded to in the preface and ascribed to the large part played by quotations, direct and indirect. But a history of philosophy, however brief, need not be a *repetitorium*, as Zeller, Windelband, Falckenberg, and Weber—mentioned above—amply demonstrate.

In short, Mr. Burt has made a book which, while abounding in facts, is badly arranged and painfully lacking in interpretation. To crown all, it has no index.

N. M. B

The Nicomachean Ethics of Aristotle—Translated with an Analysis and Critical Notes—By J. E. C. WELLDON, M. A., Headmaster of Harrow School. New York: Macmillan & Co., 1892, pp. lxvii, 352. Price $2.00.

This English version of one of the world's classics has been eagerly looked forward to for some time. Mr. Welldon's undoubted success in translating the *Rhetoric* and the *Politics*, led to the highest expectations being entertained regarding his *Ethics*. Without descending to minute philological details, it may at once be said that, from a pedagogic point of view, these expectations are not disappointed. The translation is clear and fluent, and the interpretation of technical terms is, as a rule, admirable. The difficulties of translating Aristotle are well known, but the student who tests Mr. Welldon's work by comparing it with that of some others who have attempted the same task, will almost certainly be ready to compliment him on his skill in surmounting them.

It is probable that the Greek attempt, beginning with Socrates and ending with Plotinus, to formulate a system of ethics that should rest upon a rational interpretation of life and of man's relation to the rest of the universe, is the most determined and most exhaustive in all history. The conditions of civilization contributed to make it so. This fact, combined with Aristotle's own marvelous insight into human nature and his power of analyzing it, has kept the Nicomachean ethics before the world from the time of its composition to our own. It is as rich in suggestion as it ever was, and in Mr. Welldon's fine translation may still be read and pondered by thousands

of readers, to whom, while in the Greek, it is a sealed book. The analysis that precedes the translation is especially complete and well arranged.

N. M. B.

Berghaus' Physikalischer Atlas. Dritte Ausgabe. 75 Karten in Sieben Abteilungen. Herausgegaben von Prof. Dr. HERM. BERGHAUS. Gotha: Justus Perthes, 1892. Price 88 marks.

The modern library, public or private, is rich in books of reference. No student's collection is complete without its quota of encyclopedias, dictionaries, and atlases, both general and special. Of late years these great indexes of knowledge have become marvelously accurate and comprehensive, and now amply fulfill Bacon's dream of a Pansophia. No one of these great works is more scientific in plan and execution, or more fruitful in suggestion than Berghaus' atlas, which has been well known for two generations.

The third edition, which was published a few months ago, is the highest type of German cartography. The drawing is clear and fine, the symbolism plain, and the color work almost faultless. Altogether there are 514 maps, large and small, displaying the facts concerning the geology, hydrography, meteorology, and magnetism of the earth, together with the distribution of plants, animals, and human beings over its surface. The *Physikalischer Atlas* is a necessary supplement of the geographical and statistical atlas, and no scholar, much less a teacher of history or geography or natural science, will willingly be without a copy of it on his shelves.

N. M. B.

An Introduction to Spherical and Practical Astronomy—By DASCOM GREENE, Professor of Mathematics and Astronomy in Rensselaer Polytechnic Institute. Boston: Ginn & Co., 1892, pp. 149. Price $1.60.

This little volume is prepared for students "who wish to begin the study of spherical and practical astronomy, and who are prepared to do so by a sufficient acquaintance with the several branches of mathematics and with the general principles of astronomy." An introductory chapter of definitions and a discussion of the pole, zenith, star triangle, are followed by chapters on conversion of time, transit instrument, sextant, determination of time, longitude, latitude, azimuth, figure and

dimensions of the earth, an appendix on the method of least squares, and a small collection of tables. It will thus be seen that the book treats of astronomy as applied to geodesy rather than of practical astronomy in general. With this limitation the book is a good one, and well adapted to its purpose. The amount of mathematics required is no more than the ordinary college student gets in his regular course. The explanations are clear and concise, and the treatment of the topics discussed is generally rigorous and complete as far as it goes. Of course many things are necessarily omitted in a book of such small size, but enough is given to give the beginner a good idea of the nature of the problems discussed, and of the methods of handling them. Larger works, like Chauvenet, are too bulky and extended for the beginning work of the average student. The book gives quite as much as can be mastered by the undergraduate in the time usually allotted to the subject.

Errors seem to be very few, but attention should be called to a statement in the last paragraph of p. 41. In the discussion of Mayer's equation for the reduction of transit observations, the author says that observations of four stars are sufficient to give the clock correction and the three instrumental constants, as each star gives an equation involving the four unknown quantities. The complete solution of such a series of equations is impossible, as any attempt to eliminate the azimuth and level terms results in the elimination of the clock correction term at the same time. The equations are not independent, owing to relations existing between the coefficients. If the clock correction is sought for, either the azimuth or level correction must be independently determined and applied before the solution of the equations of condition.

The addition of a short account of Sumner's method of determining latitude and longitude by circles of position is desirable in view of the present extensive use of the method.

The book is, on the whole, an excellent one for those students who wish to take up the study of astronomy as an adjunct to the study of geodesy, and it will doubtless meet with success.

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X

EDITORIAL

During the absence from the country of the Editor-in-chief, the responsibility for the editorial conduct of the EDUCATIONAL REVIEW devolves upon Mr. William H. Maxwell.

Mr. Gilman's seventeenth annual report as president of the Johns Hopkins university records continued progress in many directions. A much-needed new building, to be known as McCoy Hall, is in process of erection. It will provide an assembly room, faculty rooms, and ample accommodations for the seminaries in the various departments of language, history, and philosophy. The central library and reading room will be placed on the top floor and lighted from above. The trustees are able to erect this building because of the bequest of the late John W. McCoy.

Attention is also directed to the fact that the income of the university, from the securities given to it by the founder, is less than it was by the sum of $75,000 annually. Yet the needs of the institution increase every year. It is perhaps expecting too much from human vanity to hope that before our American millionaires found any more institutions bearing their own names, they will provide adequately for the universities already in existence and doing effective work. The Johns Hopkins is especially deserving in this respect, for it has led the way for nearly twenty years in the higher reaches of scholarship, and exerted an influence for good not measured by the limits of a continent or a hemisphere. If the funds that went to found Clark university, at Worcester, for example, or one-half of those that have been poured into the lap of the University of Chicago, had been added to the endowments of the Johns Hopkins, their value would have been multiplied many times.

During the year the Johns Hopkins academic staff numbered 65 teachers. The students enrolled amounted to 547, of whom 337, representing 146 colleges, had already taken an academic degree. During the year 41 candidates received the degree of

bachelor of arts and 37 that of doctor of philosophy. The department of history and political science under Dr. Adams attracted the largest number of students (165), but physics under Professor Rowland, chemistry under Professor Remsen, and German under Dr. Wood followed close behind with 138, 135, and 121 respectively.

The trustees, after consulting the Board of university studies, have adopted an academic costume, differing in minor details only from that prescribed at Columbia college. Every doctor of philosophy of the Johns Hopkins will hereafter be entitled to wear, on all fitting occasions, a black gown and a hood of black silk lined with scarlet silk and edged with gold. Every bachelor of arts will be entitled to wear a black gown and a hood of black stuff, lined with white silk and edged with dark blue.

Signor Martini, the successor of Professor Villari in the Italian ministry of public instruction, has submitted an elaborate and interesting programme of reforms in the educational organization of the kingdom. He proposes first to establish a *scuola unica di cultura generale*, which will follow after an elementary school course of five years duration. This new type of institution will combine some characteristics of the lower classes in the present *gynnasio* with some of those of the technical schools. The course will be three years in length and the same for both sexes. It will serve as a preparation both for the work of the higher schools and for practical life, inasmuch as manual training will be included in the curriculum. The *scuola unica* is to be established and maintained by the communes with the assistance of a subsidy from the state. Those of its graduates who are able to proceed farther will enter the five-year course of the *liceo gynnasio*. The elective system, with certain restrictions, is to be introduced here in order that the pupils may pursue that course of study which is best suited to their tastes and future occupations.

The tendency all over Europe to break up the solidarity of the secondary school course is very significant. It means an approximation to the American college system with its wide range of studies and increasing freedom of choice among them. The effort sometimes made to compare the college to the German gymnasium, and to treat it accordingly, is futile. It is much more likely that the German gymnasium will take on many features of the college.

The inauguration, on January 17, of Dr. Charles Kendall Adams as president of the University of Wisconsin was a red-letter day in the history of that rapidly growing institution. The alumni were present in large numbers, nearly every important town in the State being represented, while delegations from Chicago, St. Paul, Minneapolis, and other neighboring cities of the Northwest showed how far-reaching is the influence of the university. The State officers were interested auditors, and the members of the legislature, in session at Madison, were present in force. The exercises lasted upward of three hours, yet so uniformly excellent were the addresses that the audience do not appear to have tired of them, and the newspaper reports are unanimously glowing. With the legislature present, and the financial needs of the university great, it is not surprising that the keynote of the speeches should have been an appeal for substantial appropriations. From the opening prayer to the benediction this was the uppermost thought of each person on the programme. Chief among the addresses of welcome was that of Dr. John C. Freeman, who spoke for the faculty. Most happy, too, were the cordial remarks of President Angell of the University of Michigan, who appeared on behalf of "the sister universities." Governor Peck, speaking for the commonwealth, declared that "a university endowed by a million and a half of tax-payers is on a sounder basis than any endowed by private subscription." Other addresses were for the alumni, the students, and the regents. The inaugural address, by President Adams, on "The university and the State" was a sound and scholarly presentation of the subject. There are prevalent, he said, two ideas in regard to higher education. The one is that private endowments may safely be left to care for the interests of advanced education of every kind; the other is that it is the duty of the State to foster and support education in all its grades, from the highest to the lowest. Wisconsin is committed to the latter view, and indeed this has been the generally accepted view in the West, from the Ordinance of 1787 to the present day. Dr. Adams pointed out that we are in a period of educational transition. There is coming for the first time in this country to be a distinct difference between the college and the university. The State universities must be a part of this movement; but with the enlargement of the scope of instruction there is an embarrassment not to be overlooked—that of

increased expense. The number of subjects taught in a modern university is tenfold greater than in the old college, and the cost of material equipment far in excess of this ratio. Instruction for advanced students becomes more and more costly, and the State, if it wishes its children well taught, must be prepared to foot the bill. Were tuition charged, it would cost each pupil at the Wisconsin university $300 per annum. An incidental fee of $25 only is charged, and the State must not only make up this difference, but supply buildings and apparatus. From this it was an easy step to an argument for more funds for the Wisconsin university, and Dr. Adams closed with a very plain statement to the lawmakers of what he needed to carry on his work, and he was careful to tell them that the needs of the institution would grow with its growth, and must be met at each recurring session if they desired its high standard maintained. The prospects are that they will rise to the emergency, and prove the truth of Governor Peck's dictum.

Dr. Adams assumes charge of the Wisconsin university, as it seventh president, under most favorable auspices. In 1849 the institution had but one professor; in 1854 it sent forth its first graduates—two only, one of these being present at the inauguration of President Adams. To-day there are twelve stately and well-equipped buildings, fifty-two professors, nineteen instructors, seven special university extension lecturers, and over thirteen hundred students, of whom forty are taking post-graduate courses. The institution is making giant strides, and is already a close competitor with Ann Arbor. The prospects for a broad and healthy growth under Dr. Adams are most encouraging, and it is confidently predicted in Wisconsin that by the close of the century it will give instruction to full two thousand students.

Philistinism is coming to the front in the Chicago school board. The school management committee of the Board of Education have decided to recommend that after the present school year clay modeling studies be discontinued. Superintendent Lane did indeed pronounce an opinion in favor of their continuance; but the member of the committee who was especially active in urging the abolition of this branch of work —one is unwilling to gratify his evident desire to gain notoriety by mentioning his name—is too great a man to be influ-

enced by the opinions of educational experts. "In view of the law," he said, "and with the unmistakable voice of the people, as evidenced in the public press and by petitions and letters sent to me, I care no more for the opinions of the superintendents in opposition than for the idle whistling of the wind." Of course the general public and the press are entirely competent to settle such simple questions as those that relate to the kind of training best calculated to develop the powers of a child.

Another member of the same school board announces that he proposes to introduce a resolution providing for a reduction of 25 per cent. in the appropriations for music, drawing, and physical culture. Whether this enlightened policy will prevail or not remains to be seen. The cynical might remark that Chicago does not seem to be the best place in the world in which to hold educational congresses next summer.

The announcements have been made concerning the summer courses at Nääs and at Leipsic for teachers of manual training. At Nääs the first course begins on May 31 and extends to July 12; the second begins on August 1 and ends on September 11. In addition to practical work in the Sloyd room, the instruction will include lectures and discussions on the theory and history of Sloyd. The instruction is given without cost, and the necessary tools and materials are also provided free. Board and lodging may be had at a cost of about $20 for the course.

Dr. Goetze's courses at Leipsic begin on June 26 and July 31, respectively, and end on July 29 and September 2. Here the instruction includes cardboard work, carpentry, wood-carving, and both wood and metal work suitable for rural schools. The applications of manual training, in the construction of physical apparatus and mathematical models, are also indicated. The cost of a four weeks' course, including all living expenses and tuition fees, is estimated at about $40.

At either Nääs or Leipsic the American teacher will be able to pass a pleasant and profitable vacation at very slight expense.

A good illustration of what a small board of education, unfettered by entangling political alliances and acting with an eye single to the best interests of the schools under its charge,

can accomplish, is furnished by the recent experience of the city of Paterson, N. J. When the present board came into office in April, 1892, the finances had become disorganized by wanton extravagance and illegal expenditure, while the standard of teaching, owing to the lack of efficient supervision and the withering influence of personal politics, had fallen very low indeed. In less than a year extensive improvements, amounting almost to a revolution, have been established. The kindergarten, properly equipped, has been introduced into all the schools as a preparation for the primary course. Teachers in the grammar grades no longer give instruction each one in all the subjects of a grade, but teach under the departmental system. They have become specialists. Manual training has been put into the grammar grades, and the training school for teachers has been greatly improved. The course of study has been thoroughly revised and a new list of text-books, selected for merit alone, has been adopted. A plan of instruction for teachers has been carefully elaborated, while supervision has been made effective. "Real teaching and vital instruction as contrasted with text-book questioning," to quote the words of a recent report of the committee on education, "have been instituted, and altogether a new departure in study, discipline, and instruction has been organized." All this has been accomplished in addition to placing the finances of the department on a sound basis and planning building operations on a large scale. Paterson is one of the very few cities in this country in which the board of education, as such, has made a determined effort to elevate the public schools. When such an effort by such a body is honestly made, there is no other agency so powerful. The authority that holds the purse strings will always be the most potent. Hence it is that the standard of public education in so many of our cities is low. Hence it is that Quincy, Mass., and Paterson, N. J., have won so enviable a reputation, have set a standard which other cities and their boards of education would do well to study and to emulate.

In the report prepared by Commissioner Harris on the schools of the District of Columbia, referred to last month,[1] there are many wise and significant things. Among them is this: "It would seem to a person well acquainted with the

[1] EDUCATIONAL REVIEW, V: 208.

defects of the graded system as it exists, that the abolition of examinations for admission to the high school wrought some good for the District. A dull mind has now some chance of trying his intellect on those tools of thought which are able in some measure to make up for differences in talent. A dull boy who has struggled through quadratic equations in algebra, or learned to read Latin, or studied geometry, has by aid of those powerful instruments of research distanced all the talented boys of the grammar school. He can perform mental problems that they will never be able to solve until they invent or master such mathematical and philosophic instruments for themselves." The truth of this doctrine will be generally admitted. The training that comes from the study of algebra, geometry, and Latin will, it must be conceded, often give the comparatively dull mind a length of reach and a strength of grasp that are wanting in an intellect that may be naturally brighter but is less perfectly developed. But is this an argument against the examination for admission to the high school? It it not rather an argument in favor of giving all minds, bright and dull alike, an opportunity to sharpen their wits by using "such mathematical and philosophic instruments," before they enter the high school? If a little Latin, geometry, and algebra taught to a dull boy, after he has entered a high school, will enable him to "distance" all his "talented" companions in the grammar school, they will surely have a similar, if not an equal effect, if they are taught in the grammar school. Commissioner Harris's statement, if true, is a strong argument in favor, not of abolishing the examination in question, but of "enriching" the grammar school course by the introduction of those mind-sharpening studies. The examination for entrance to the high school is, in the judgment of many, worthy of retention because of its stimulating effect on the teachers of the grammar school.

State Superintendent Crooker, of New York, has adopted a new regulation to govern the "uniform examinations for commissioners' certificates," which can hardly fail to be productive of great good. The establishment by Superintendent Draper, Mr. Crooker's predecessor, of "uniform examinations" for teachers' licenses in rural districts, was in itself a long step forward. It elevated the profession of teaching and resulted in improvement in the schools, because it raised the standard of

scholarship required to obtain a teacher's certificate. The weak point of the system was in the marking of the papers. This work, Mr. Draper, much against his will, was compelled, by stress of circumstances, to leave in the hands of the county commissioners. Now, the county commissioners, while including in their number many excellent men, are not, as a rule, selected because of their acquaintance with educational affairs. The office is elective, and nominations to it are made for the most part as a reward for political services. To place the marking of papers in the hands of political officers was in no small degree to impair the efficiency of the system. This defect Superintendent Crooker has not been slow to appreciate, and has now taken steps, at least in part, to remedy. In a circular recently issued, he uses these significant words: "Commissioners are also advised that in all future examinations for certificates of the first grade, all answer papers submitted will be forwarded to the State Superintendent for examination, marking, and filing." It now remains for Superintendent Crooker to adopt a similar regulation with regard to the second and the third grade certificates, in order to make the system of "uniform examinations" for teachers' licenses in rural schools completely effective.

What a commentary the action of Superintendents Draper and Crooker is on the system of supervising rural schools through officers elected because of political services! Superintendent Draper took the ground, in effect, that the county commissioners of New York could not be trusted to make questions for the examination of teachers. Superintendent Crooker has discovered that these officers cannot be intrusted with the delicate duty of valuing the answers to questions. The action of these two superintendents is the condemnation of the system. They have made it evident, once and forever, that the supervision of rural schools should be divorced from politics.

Mr. John Swett, Superintendent of the San Francisco public schools, has the courage of his convictions. He believes that the method of appointing teachers in that city is thoroughly bad, and he is not afraid to say so. He sets forth the iniquities of the method with characteristic vigor in his last annual

report: "The weakest point in our school system is the method of electing teachers. If there is any other city in our country that has a method so utterly opposed to all educational principles, I have not yet heard of it. Without any doubt whatever, it is the worst in the world. It is purely a system of 'personal patronage.' It is an outgrowth of the 'spoils system' in politics. It is contrary to all principles of civil service reform. It took root about fifteen years ago, and it has grown worse year by year. . . As places become vacant during the year, each director, in regular order, makes an appointment, and by mutual understanding this appointment is absolute, the only condition required being that the nominee must be the holder of a legal certificate. . . Under this system no selection of the best teachers out of the large number of applicants is possible. The election of a teacher becomes merely the personal opinion or personal favoritism of one man. Young women who are graduates of the High School and Normal School are reduced to a dead level with young girls who leave the grammar school and in a few months cram to pass an examination for a certificate. The most talented and accomplished teachers, coming here from other cities, stand no chance of an appointment on merit. School Directors are subjected to the political or personal 'pull' of United States Senators, of Governors and ex-Governors, city officials, Supervisors, members of the county committee, political clubs, and active politicians generally." This graphic picture of a method of appointing teachers, that is a crime against every sound fundamental principle of school administration, represents, unfortunately, the condition of many another city school system as well as that of San Francisco. It is not every school superintendent, however, who has the manliness to proclaim to his official superiors and to the world, the enormity of evils which he is obliged to observe but is powerless to prevent. Mr. Swett deserves all honor for the position he has taken. The words in which he concludes his discussion of this all-important subject, should be pondered by every man who assumes the duties of a member of a school board: "It is sometimes urged that, as School Directors receive no salary for their services, they have the right to the personal patronage of appointing their friends. But it seems to me that citizens who seek and secure such an office of honor have no moral right to prostitute that office to selfish and personal ends."

At the present writing the cabled accounts of Mr. Gladstone's speech in introducing the home rule bill for Ireland make no mention of any provisions for the administration of public education. And yet, next to the great political question of the hour, there is no matter that has occasioned so much excitement and discussion in that country during the past six months as this very question of public education.

The national schools of Ireland are administered in part by local authorities—"patrons" they are called—but chiefly from a central office in Dublin controlled by commissioners selected to represent the various religious denominations. Hitherto religious instruction has been given only under certain restrictions. Some time, however, before the Conservative ministry went out of office, Chief Baron Palles brought forward a proposition in the board of commissioners to the effect that when one Protestant school and one Roman Catholic school have existed within a short distance of each other for three years or longer, all restrictions on giving religious instruction during school hours should be removed, and that the use of religious emblems and text-books should be allowed. The Protestant members of the commission, and Protestants in general, regard this movement as a direct attempt to establish government-supported denominational schools, and have opposed it with all the means and energy at their disposal.

The proposal received the votes of a majority of the commissioners, and then went to the Lord Lieutenant for his approval. While consideration was pending, however, the Liberal government came into power, and the new Irish executive, on the advice of the Chief Secretary, Mr. John Morley, has refused to sanction the proposed new rule. What would be the effect on public education in Ireland of the establishment of an Irish parliament empowered to legislate on all domestic affairs, is one of the most interesting questions connected with the home rule movement.